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# CONTAMINATION ASSESSMENT REPORT

UST 701
(SCDHEC GWPD SITE ID # 17663)
NAVAL BASE CHARLESTON
CHARLESTON SC



### Prepared for:

DEPARTMENT OF THE NAVY SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND CHARLESTON, S.C.



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S.C. UST SITE REHABILITATION CONTRACTOR # 145

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#### **Executive Summary**

Environmental Detachment Charleston (DET) performed a Contamination Assessment (CA) for the Navy at Building 701 at the former Charleston Naval Base (NAVBASE). The CA was performed between 19 March 1998 and 8 April 1998 in response to contamination detected in soil samples taken during removal of an Underground Storage Tank (UST).

The CA field activities included advancing eleven soil borings to the water table to assess the horizontal and vertical extent of potential hydrocarbon contamination in soil at the site and taking four surface soil samples from the area surrounding the former tank location to assess risk to site residents. A soil sample from each soil boring and the surface soil samples were analyzed for Polynuclear Aromatic Hydrocarbons (PAHs) and Benzene, Toluene Ethylbenzene and Xylene plus Naphthalene (BTEX + Naphthalene) Chemicals of Concern (COCs). CA field activities did not include activities to characterize groundwater at the site as the laboratory analysis of soil samples taken at the water table failed to detect any COC in excess of groundwater protection Risk Based Screening Levels (RBSLs) (see below).

The results of the CA field investigation indicate no threat exists to groundwater or site residents at the former UST 701 site. No COCs were detected above groundwater protection RBSLs in soil boring samples, and analysis of surface soil samples failed to detect any COC.

Based on the findings of the CA of the former UST 701 site, the Navy recommends no further action for this site

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## LIST OF ACRONYMS AND ABBREVIATIONS

bgs below the ground surface

BTEX+Naphthalene Benzene, Toluene Ethylbenzene and Xylene plus Naphthalene

CA Contamination Assessment
CIA Controlled Industrial Area
COC Chemical of Concern

CSAP RFI Final Comprehensive Sampling and Analysis Plan

DET Environmental Detachment Charleston

DL Detection Levels

FID flame ionization detector

ft/day feet per day

ft²/day square feet per day gpm gallons per minute

GWPD Ground Water Protection Division
MCL Maximum Contaminant Level
mg/kg milligrams per kilogram

NAVBASE former Charleston Naval Base

OVA organic vapor analyzer

PAH Polynuclear Aromatic Hydrocarbon

RBC Risk Based Concentration

RBCA Risk-Based Corrective Action for Petroleum Releases

RBSL Risk Based Screening Level

RCRA Resource Conservation and Recovery Act

RFI RCRA Facility Investigation
SAP Sampling and Analysis Plan
SCAP Soil Corrective Action Plan
SCDHEC South Carolina Department of

SCDHEC South Carolina Department of Health and Environmental Control

SDWA Safe Drinking Water Act

SOUTHDIV Southern Division Naval Facilities Engineering Command

SSL Soil Screening Level

USEPA United States Environmental Protection Agency

UST Underground Storage Tank

#### 1.0 INTRODUCTION

DET removed an UST at Building 701 at the NAVBASE. Soil samples taken during UST removal contained contamination requiring further investigation. Southern Division Naval Facilities Engineering Command (SOUTHDIV) requested the DET to prepare a Sampling and Analysis Plan (SAP) to investigate the site for the U. S. Navy. This Contamination Assessment Report presents the findings and recommendations of the investigation to the South Carolina Department of Health and Environmental Control (SCDHEC) for review and approval.

- 1.1 PURPOSE. A field investigation was performed between 19 March 1998 and 8 April 1998 at the former UST 701 site to assess the horizontal and vertical extent of soil and groundwater contamination. The purpose of this report is to present the findings of this investigation and provide recommendations for remedial actions to be taken at the UST 701 site.
- 1.2 SITE DESCRIPTION. The NAVBASE is in the city of North Charleston, on the west bank of the Cooper River in Charleston County, South Carolina. The developed portion of the NAVBASE occupies the west bank of the Cooper River starting at a boundary 2300 feet upstream of Noisette Creek and ending at Shipyard Creek. The northern section of the NAVBASE (Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Zones A, B, C and D) contains a mixture of warehouses, offices and former Navy housing areas. The central section of the NAVBASE (RFI Zones E and F) was occupied primarily by the controlled industrial area (CIA) of the former Naval Shipyard and its associated offices and warehouses. The southern section of the NAVBASE (RFI Zones G, H and I) along the Cooper River is occupied by piers, barracks, training buildings, offices, storehouses and fuel tanks which formerly supported naval vessels homeported at Charleston. The north bank of Shipyard Creek in the southern part of the base is largely undeveloped and consists of recreational areas and a large dredge spoil area.

The former UST 701 site is in RFI Zone B in the northern portion of the NAVBASE. Zone B consists of a golf course and housing area located immediately south of Noisette Creek. Building 701 is a single family dwelling located in the southwest corner of Zone B at 399 Turnbull Avenue. Building 701 is located on the slope of a hill overlooking Turnbull Avenue. The former UST location is fifteen feet from the northwest corner of Building 701.

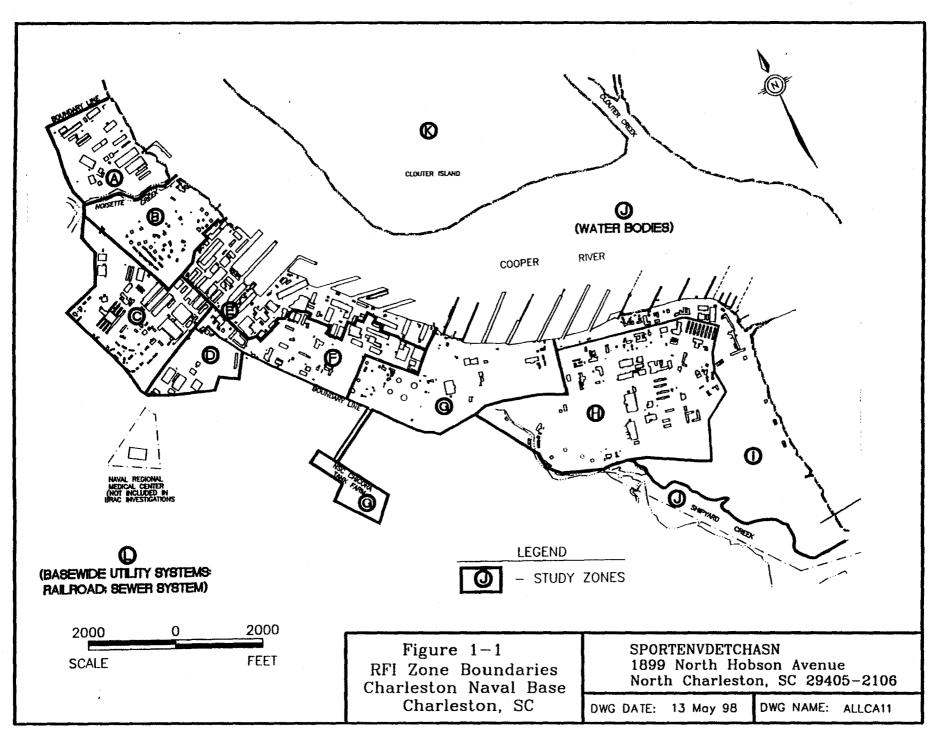
1.3 SITE BACKGROUND. The UST at Building 701 (SCDHEC Ground Water Protection Division (GWPD) Site Identification No. 17663) was a 280 gallon unregulated heating oil tank installed prior to 1976 and used until April 1996. The tank was constructed of steel and connected to Building 701 by steel piping. There were no recorded releases while the tank was in service.

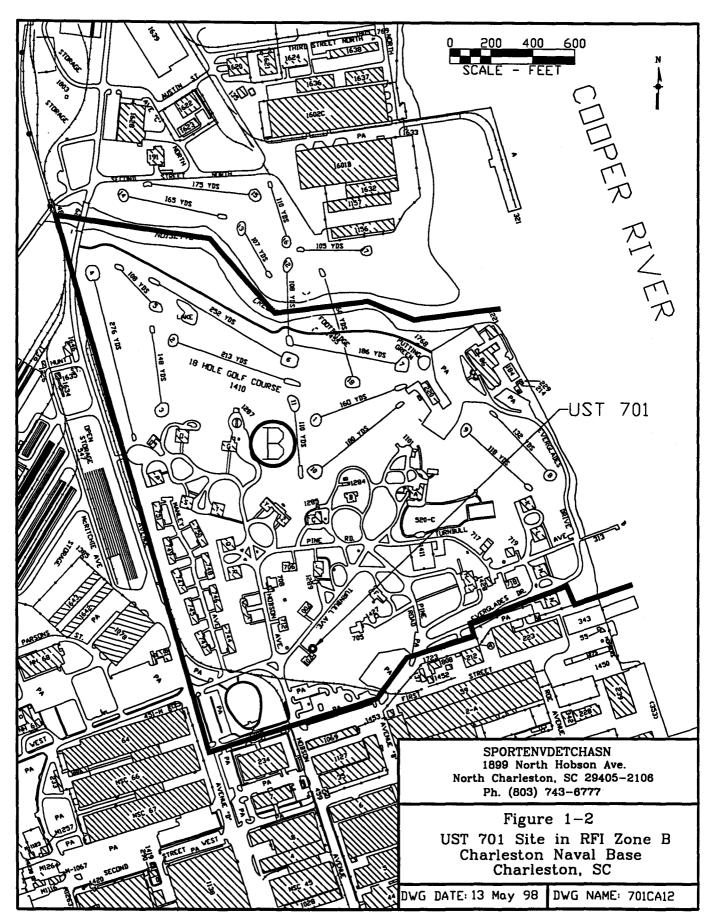
Between 6 June 1996 and 10 June 1996, the UST and its associated piping were removed. Residual waste oil was pumped into a 55 gallon drum for recycling before the tank was removed. The tank and piping were reported to be in good condition with no visible holes or corrosion when removed. The tank was subsequently cleaned and cut up for recycling as scrap. Excavated soil was returned to the tank pit, after which the top of the excavation was filled to grade with clean fill.

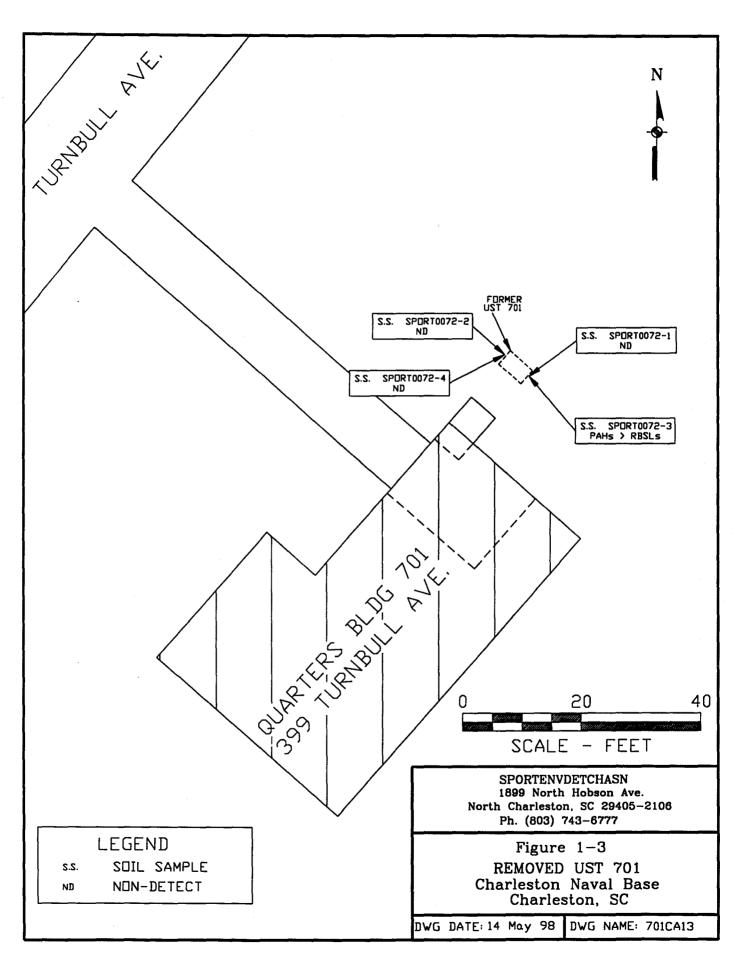
Four soil samples were taken at the base of the excavation before it was filled and analyzed for PAHs and BTEX + Naphthalene. Sample SPORT0072-3 contained concentrations of PAHs in excess of SCDHEC RBSLs. See Figure 1-3.

No groundwater was encountered while removing UST 701.

- 1.4 SCREENING LEVELS FOR SOIL AND GROUNDWATER Where provided, RBSLs from Appendix B of the SCDHEC Risk-Based Corrective Action for Petroleum Releases (RBCA) dated June 20, 1997 were used in the preparation of this report. For COCs not listed in the RBCA, the screening levels below were used. For COC transfer from soil to groundwater in accordance with SCDHEC correspondence dated September 2, 1997 (Paul Bristol to J. T. Amey), groundwater protection Soil Screening Levels (SSLs) from the Soil Corrective Action Plan (SCAP) dated January 28, 1997 were used for COCs not listed in Table B3 of the RBCA. For ingestion of or dermal contact with surface soil at residential sites residential soil ingestion Risk Based Concentrations (RBCs) from the United States Environmental Protection Agency (USEPA) Region III RBC Table dated September 23, 1996 were used as screening levels for COCs not listed in Table B6 of the RBCA. For Groundwater, COCs not listed in Table B1 of the RBCA, Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs) were used as screening levels for COCs listed in the SDWA, and Tap Water RBCs from the SCAP were used as screening levels for COCs not listed in either the RBCA or SDWA.
- 1.5 USE OF RFI DATA The NAVBASE is the site of an ongoing RFI; the UST 701 location is in Zone B of the RFI. Data taken as part of the RFI, including geological information, hydrogeological information, well drilling logs and groundwater sampling data was used in the preparation of this report.
- **1.6 INITIAL ABATEMENT AND INTERIM REMEDIAL ACTION.** No initial abatement or interim remedial actions were taken at the UST 701 site.







#### 2.0 SITE GEOLOGY AND HYDROGEOLOGY

**2.1 GEOLOGY**. Based on information provided in the Draft Zone I RCRA Facility Investigation Report, NAVBASE Charleston, dated January 1996, Charleston South Carolina is located in the southern Atlantic Coastal Plain. The surficial geology of the region consists of the Quaternary-age sands, silts and clays of the Wando Formation. Below the Wando Formation are the Oligicene-age Ashley Formation and the Eocene-age Parkers Ferry and Harleyville Formations, known collectively as the Cooper Group. Below the Cooper Group is the Eocene-age Santee Limestone.

At the NAVBASE, the upper surface of the Ashley Formation is an erosional surface ranging from 35 feet to 77 feet below the ground surface (bgs). Overlaying the Ashley Formation is the Wando Formation which at the NAVBASE typically consists of upper and lower sand layers divided by a layer of "marsh clay". The surface contours of the NAVBASE area were extensively changed by fill operations during the base's life, particularly in the lower portion of the NAVBASE, which was originally tidal marsh.

#### 2.2 HYDROGEOLOGY.

**2.2.1** Regional. (Excerpted from Ensafe/Allen & Hoshall, Draft Zone I RCRA Facility Investigation Report NAVBASE Charleston dated January 1996.) Groundwater occurs under water table or poorly confined conditions within the Pleistocene deposits overlying the Ashley Formation. Transmissivities in the Pleistocene aquifer are generally less than 1,000 square feet per day (ft²/day) and well yield are variable, ranging from 0 to 200 gallons per minute (gpm). This groundwater contains high concentrations of iron and is commonly acidic at shallow depth (Park, 1985).

The Cooper Group is hydrogeologically significant mainly because of its low permeability. In most locales, its sandy, finely granular limestones produce little or no water and act as confining material that produces artesian condition in the underlying Santee Limestone.

2.2.2 Site Specific. From lithologic cross-sections in the Zone B RFI Report dated November 21, 1996, above the Ashley Formation in Zone B are two sand layers divided by a clay layer described as "marsh clay" in the RFI Reports. From the Draft Zone I RCRA Facility Investigation Report, vertical hydraulic conductivity of the Ashley Formation beneath the NAVBASE was measured as 0.0027 feet per day (ft/day) during the Zone H RFI and the vertical hydraulic conductivity of the marsh clay layer was measured as 0.001 ft/day during the Zone I RFI. The Ashley Formation acts as a lower confining layer, while the marsh clay functions as an aquitard separating the upper and lower sand layers. At the NAVBASE, rainwater absorbed into the ground will flow downward to the marsh clay and then flow toward a discharge point into a body of surface water.

The former Building 701 UST site is located approximately 1400 feet from the Cooper River. Based on potentiometric maps included in the final Zone B RFI Report dated November 21, 1996, ground water in the surficial aquifer beneath the former UST location flows in a southeast direction.

2.3 SURFACE HYDROGEOLOGY. Parts of the southern portion of NAVBASE are drained by Shipyard Creek while some northern areas are drained by Noisette Creek The drainage basins of both waterways include areas other than NAVBASE. These waterways are tributaries of the Cooper River. Surface drainage over the remainder of NAVBASE flows directly into the Cooper River, which discharges into Charleston Harbor. Surface drainage at the former UST 701 site is downhill onto Turnbull Avenue, which carries water to a storm drain emptying into the Cooper River.

#### 3.0 CONTAMINATION ASSESSMENT ACTIVITIES

#### 3.1 SOIL SAMPLE COLLECTION PROGRAMS

3.1.1 Soil Boring Program. A soil boring program was performed at Quarters Building 701 to assess the horizontal and vertical extent of hydrocarbon contamination in the vadose zone at the site. A total of 11 borings were advanced to the water table using stainless steel hand augers. Figure 3-1 shows soil boring locations.

The locations of the soil borings performed differ from those proposed in the Sampling and Analysis Plan - UST NS 701 dated June 26, 1997. The proposed boring locations consisted of a cluster around the location of the high level sample taken during UST removal and a group of samples east of the former UST location in the presumed direction of groundwater flow. Some samples were relocated west (and downhill) of the former UST location to provide samples following the line of surface drainage.

The general technical approach applied to soil borings at the UST 701 site was to collect samples from the underlying soils at 2 foot intervals. Soil samples were screened in the field by performing headspace analysis using an organic vapor analyzer (OVA) equipped with a flame ionization detector (FID). No effort was made to evaluate the possible presence of methane by utilizing a charcoal filter. The soil sample from each boring with the greatest ova headspace analysis was submitted to an analytical laboratory to determine the relative concentrations of fuel oil contaminants in the soil. Where all samples from a soil boring had a "zero" headspace analysis, the sample taken at a 6 foot bgs depth (the approximate depth of the base of the removed UST) was submitted for laboratory analysis, with the exception of two samples, one at the source area and one downgradient, which were taken immediately above the water table. Characterization (source area) samples were collected from a boring at the approximate location where contaminants were found during tank removal. Delineation or "clean" borings were made around a perimeter outside the suspected extent of contamination.

The OVA used to monitor soil samples was calibrated daily against a methane standard to ensure that the OVA was functioning properly.

- 3.1.2 Surface Soil Sampling Program Because of the current and potential future use of this site as residential, a surface soil sampling program was performed at the former UST 701 site to assess risk to site residents. A total of four surface soil samples were collected immediately outside the corners of the tank removal excavation using stainless steel hand augers.
- 3.1.3 Sampling Equipment Decontamination All soil sampling equipment was decontaminated before and after each use to prevent incidental cross-contamination of the soil samples. Decontamination was performed at the DET decontamination station in the former Charleston Naval Shipyard Building 25. The decontamination procedure consisted of the following steps in order: a wash with a detergent/water solution, a potable water rinse, a deionized water rinse, a rinse with pesticide grade isopropyl alcohol and a second deionized water rinse. Once decontaminated, hand augers were wrapped in aluminum foil to prevent

contamination of the augers before use.

#### 3.2 MONITORING WELL INSTALLATION PROGRAM.

The Sampling and Analysis Plan UST NS 701 dated June 26, 1997 proposed that one temporary monitoring well be installed at the former UST 701 site. However, as the soil boring program of section 3.1.1 failed to detect any COC above groundwater protection RBSLs (see section 4.2 below), no monitoring well installation program was undertaken at the former UST 701 site.

#### 3.3 SAMPLING AND ANALYSIS PROGRAM.

3.3.1 Soil Sampling Program Confirmatory laboratory analyses were performed on soil samples collected from the former UST 701 site to document soil quality at the site. The samples were collected between 19 March 1998 and 8 April 1998.

Characterization (source area) samples were taken at the approximate location where contamination was detected during UST removal. Characterization samples were collected from soil boring NBCT701S01 at a depth of 6 feet bgs and boring NBCT701S15 at a depth of 12 feet bgs immediately above the water table.

Delineation or "clean" samples were collected from nine soil borings NBCT701S02 through NBCT701S10 surrounding the former tank location. Samples NBCT701S020103 through NBCT701S090103 were collected from 6 feet bgs, approximately level with the base of the removed tank, while sample NBCT701S100105 was collected from 10 feet bgs, immediately above the water table and downgradient from the source area.

Surface soil samples were taken from sampling locations NBCT701S11 through NBCT701S14 immediately outside the corners of the UST excavation.

All soil samples were collected as grab samples. Samples for volatile analysis were immediately packed in appropriate laboratory containers which were then packed on ice to minimize volatilization of the potential contaminants. Samples for semivolatile analysis were immediately packed and set aside to wait headspace analysis. For each soil boring, separate samples for volatile and semivolatile analysis were collected and identified for all depth intervals before OVA headspace analysis was performed. After headspace analysis was performed and the results recorded, the samples from the interval with the greatest headspace analysis were retained, packed on ice, for laboratory analysis, with all other samples being returned to the boring from which they were taken.

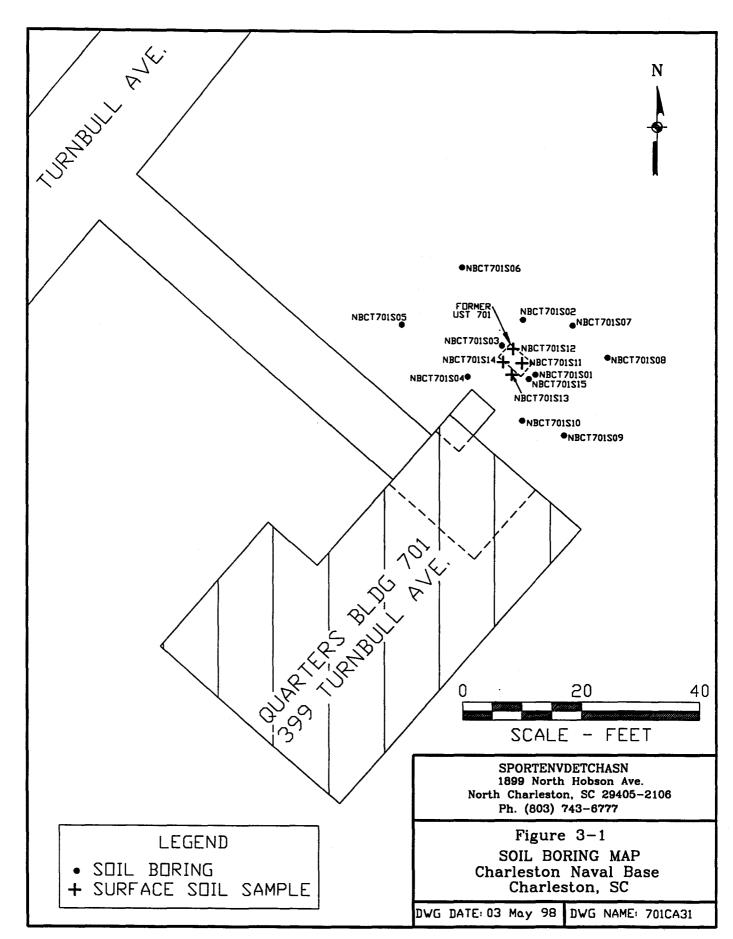
Soil samples were shipped to a SCDHEC-approved laboratory for analysis. Site soil samples were handled and additional Quality Assurance/Quality Control samples prepared as required by the RFI Final Comprehensive Sampling and Analysis Plan (CSAP) dated August 30, 1994. Chain of custody records are contained in Appendix B.

Since the removed UST 701 contained fuel oil, soil samples from the soil boring program were

analyzed for the parameters listed for Diesel or Kerosene in Table 1 of the RBCA. Volatile samples were analyzed for BTEX+Naphthalene; semivolatile samples were analyzed for PAHs. Samples from the surface soil sampling program were analyzed for PAHs only, on the premise that volatile COCs would have evaporated from the sandy soil in the two year interval (April 1996 to March 1998) between UST removal and the sampling program.

Table 3-1
Survey Data for Soil Borings
Quarters Building 701
399 Turnbull Avenue
North Charleston South Carolina

South Carolina State Plane Coordinates										
Soil Boring			Ground Elevation							
Number	North	East	(ft. msl)							
NBCT701S01	377702.81	2316363.13	15.14							
NBCT701S02	377712.08	2316361.04	15.43							
NBCT701S03	377707.72	2316357.47	15.21							
NBCT701S04	377702.42	2316351.67	15.26							
NBCT701S05	377711.25	2316340.41	14.19							
NBCT701S06	377720.91	2316350.67	14.19							
NBCT701S07	377711.13	2316369.35	15.61							
NBCT701S08	377705.70	2316375.21	15.57							
NBCT701S09	377692.47	2316367.93	14.99							
NBCT701S10	377694.96	2316360.90	14.96							
NBCT701S11	377704.72	2316360.88	15.09							
NBCT701S12	377707.14	2316359.37	15.19							
NBCT701S13	377702.76	2316359.12	15.11							
NBCT701S14	377704.89	2316357.70	15.22							
NBCT701S15	377702.05	2316362.00	15.02							



#### 4.0 CONTAMINATION ASSESSMENT FINDINGS

4.1 POTABLE WATER WELL/SENSITIVE RECEPTOR SURVEY. There are no potable water wells on the NAVBASE. The former UST 701 is located more than 1/4 mile inside the NAVBASE boundary, therefore no potable water wells are within a 1/4 mile radius of the UST 701 site. The nearest sensitive receptors are a storm drain catch basin located 120 feet west of the tank site at the corner of Hobson and Turnbull Avenues and a second storm drain catch basin 160 feet north of the tank site in the driveway of 378 Turnbull Avenue. Both catch basins empty to the Cooper River through outfall number 20 as shown in Charleston Naval Shipyard Public Works Drawing H409-72. Surface runoff from the former UST 701 site will most probably drain to the Cooper River through the catch basin at 378 Turnbull Avenue as the curb on the west side of Turnbull Avenue will block drainage to the nearer catch basin.

#### 4.2 SOIL CONTAMINATION.

4.2.1 Soil Vapor Monitoring Results As discussed in Subsection 3.1.1, a total of 11 soil borings were advanced to the water table at the former UST 701 site to help define the horizontal and vertical extent of contamination at the site. The borings were designated NBCT701S01 through NBCT701S10 and NBCT701S15. As the borings were advanced, the soils were screened for hydrocarbon vapors at two foot intervals using an OVA.

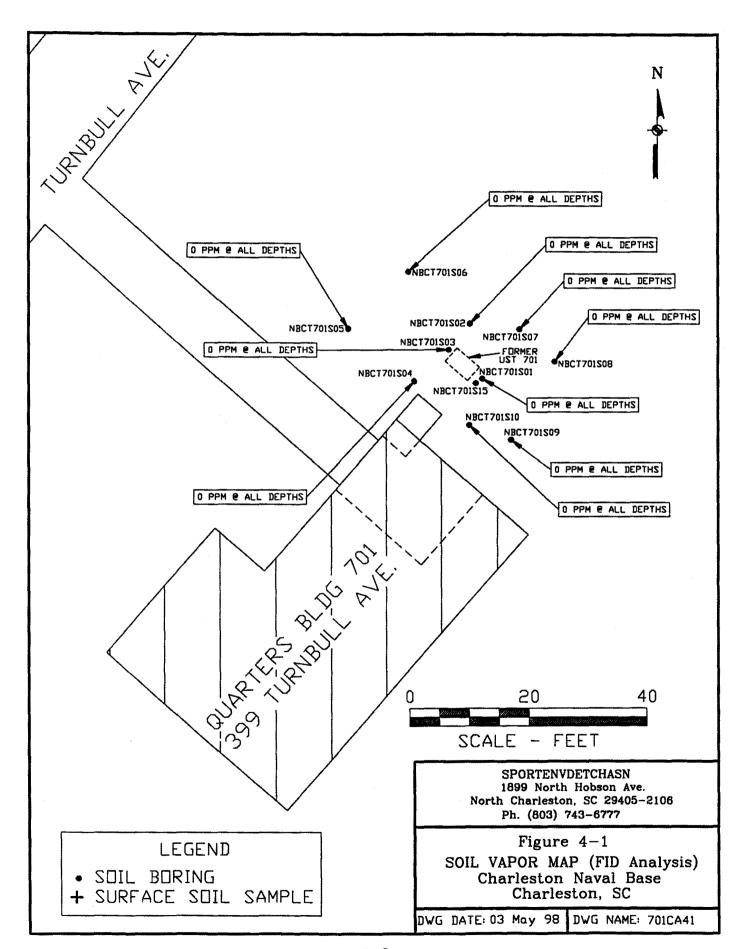
The results of the soil vapor monitoring failed to reveal any evidence of hydrocarbon contamination in soils at the UST 701 site. The OVA detected no contamination in any of the soils screened at UST 701. Figure 4-1 is a soil vapor map of the site showing the boring locations.

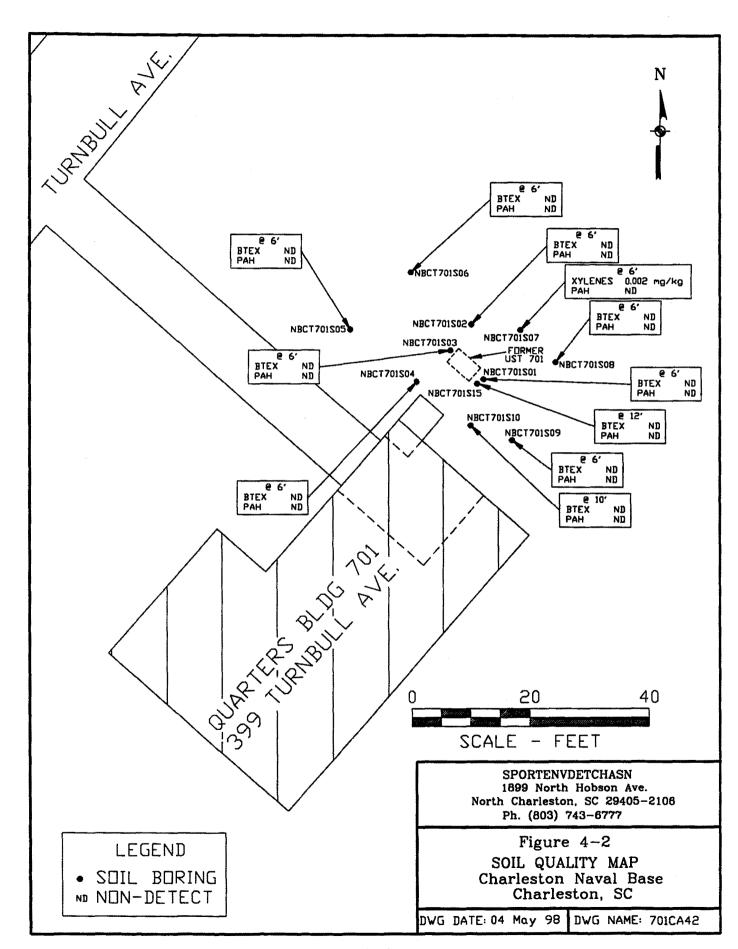
#### 4.2.2 Soil Sampling Results

**4.2.2.1 Soil Boring Sampling Results** Laboratory analysis was performed on a sample from a single depth interval in each of the soil borings NBCT701S01 through NBCT701S10 and NBCT701S15. For borings NBCT701S01 through NBCT701S09, analysis was performed on the samples taken from the 6 foot deep interval (approximately level with the base of the removed tank), while at borings NBCT701S10 and NBCT701S15, soil from the interval immediately above the water table was analyzed. In each case, samples were analyzed for PAHs and BTEX + Naphthalene.

The results of the analysis of soil boring samples are presented in Table 4-1. In only one instance did the analysis detect a COC. Xylene was detected at a concentration of 0.0025 milligrams per kilogram (mg/kg) in the 6 ft deep interval sample taken from soil boring NBCT701S07. This solitary detection is negligible when compared to the groundwater protection RBSL of 44 mg/kg for Xylene in sandy soil. Figure 4-2 illustrates the analytical results for soil boring samples. Copies of the analytical reports are contained in Appendix C.

4.2.2.2 Surface Soil Sampling Results Laboratory analysis was performed on four surface soil samples taken the soil surrounding the UST excavation. The results of the analysis are presented in Table 4-2. No COC was detected in any of the surface soil samples. However, surface soil samples NBCT701S110101, NBCT701S120101 and NBCT701S130101 contained matrix interferences which raised Detection Levels (DLs) for PAHs to 0.662-0.666 mg/kg, which exceeds the SCDHEC Residential Ingestion/Dermal Contact RBSL for Dibenzo(ah)anthracene and the residential soil ingestion RBC for Benzo(a)pyrene (both 0.088mg/kg). Figure 4-3 illustrates the analytical results for surface soil samples. Copies of the analytical reports are contained in Appendix C.





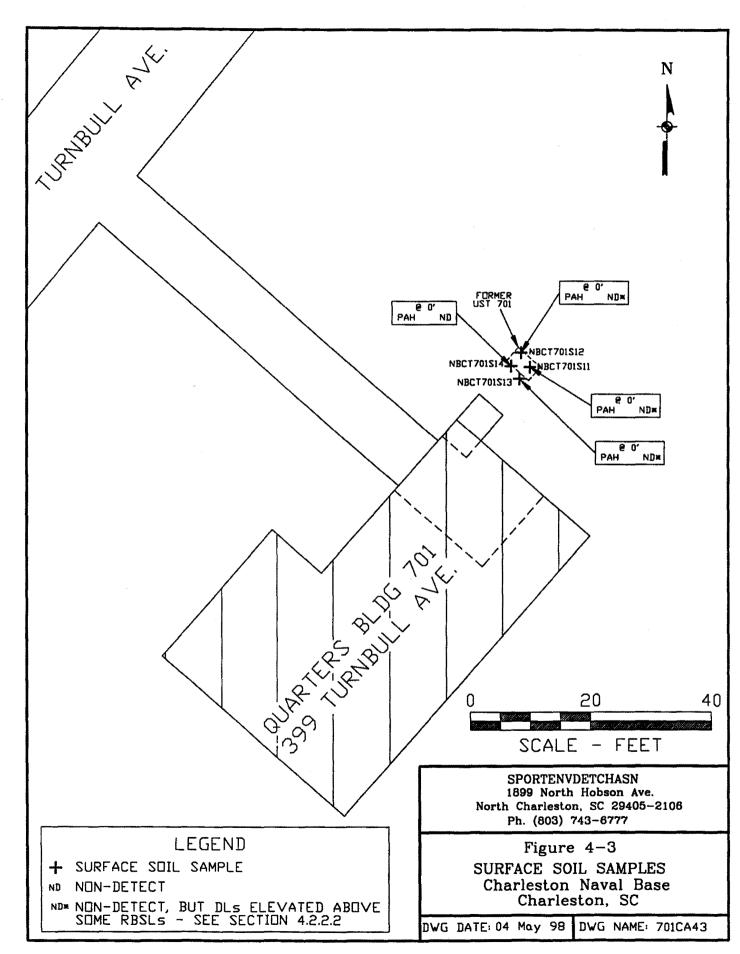


Table 4-1 Analytical Results for Soil Samples Former UST 701 Site 399 Turnbull Avenue, North Charleston SC

SAMPLE NUMBER		NBCT701S010103	NBCT701S020103	NBCT701S030103	NBCT701S040103	NBCT701S050103
Associated Trip Blank		SPORT0625-1	SPORT0625-1	SPORT0625-1	SPORT0625-1	SPORT0625-1
ANALYTE:	RBSLs					
Benzene	0.007 mg/kg	, ND	ND	ND	ND .	ND
Ethylbenzene	1.50 mg/kg	ND	ND	ND .	ND	ND
Toluene	1.70 mg/kg	ND	ND	ND	ND	ND
Xylenes (total)	44.0 mg/kg	ND	ND	ND	ND	ND
Naphthalene	0.200 mg/kg	ND	ND	ND	ND	ND
Acenaphthene	20.0 mg/kg	ND	ND	ND	ND	ND
Acenaphthylene	20.0 mg/kg	ND	ND	ND	ND	ND
Anthracene	430. mg/kg	ND	ND	ND	ND	ND
Benzo(a)anthracene	0.700 mg/kg	ND	ND	ND	ND	ND
Benzo(a)pyrene	4.00 mg/kg	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.660 mg/kg	ND	ND	ND	ND	ND
Benzo(ghi)perylene	98.0 mg/kg	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	4.60 mg/kg	ND	ND	ND	ND	ND
Chrysene	0.660 mg/kg	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	2.60 mg/kg	ND	ND	ND	ND	ND
Fluoranthene	98.0 mg/kg	ND	ND	ND	ND	ND
Fluorene	16.0 mg/kg	ND	ND	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	35.0 mg/kg	ND	ND	ND	ND	ND
Naphthalene	0.200 mg/kg	ND	ND	ND	ND	ND
Phenanthrene	98.0 mg/kg	ND	ND	ND	ND	ND
Pyrene	140. mg/kg	ND	ND	ND	ND	ND

ND - Non-Detect

mg/kg - milligrams per kilogram

Table 4-1 Analytical Results for Soil Samples Former UST 701 Site 399 Turnbull Avenue, North Charleston SC

SAMPLE NUMBER		NBCT701S060103	NBCT701S070103	NBCT701S080103	NBCT701S090103	NBCT701S100105
Associated Trip Blank		SPORT0625-1	SPORT0628-1	SPORT0628-1	SPORT0628-1	SPORT0628-1
ANALYTE:	RBSLs					
_					-	
Benzene	0.007 mg/kg	ND	ND	ND	ND	ND
Ethylbenzene	1.50 mg/kg	ND	ND	ND	ND	ND
Toluene	1.70 mg/kg	ND	ND	ND	ND	ND
Kylenes (total)	44.0 mg/kg	ND	0.002 mg/kg	ND	ND	ND
Naphthalene	0.200 mg/kg	ND	ND	ND	ND	ND
Acenaphthene	20.0 mg/kg	ND	ND	ND	ND	ND
Acenaphthylene	20.0 mg/kg	ND	ND	ND	ND	ND
Anthracene	430. mg/kg	ND	ND	ND	ND	ND
Benzo(a)anthracene	0.700 mg/kg	ND	ND	ND	ND	ND
Benzo(a)pyrene	4.00 mg/kg	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	0.660 mg/kg	ND	ND	ND	ND	ND
Benzo(ghi)perylene	98.0 mg/kg	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	4.60 mg/kg	ND	ND	ND	ND	ND
Chrysene	0.660 mg/kg	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	2.60 mg/kg	ND	ND	ND	ND	ND
Fluoranthene	98.0 mg/kg	ND	ND	ND	ND	ND
Fluorene	16.0 mg/kg	ND	ND	ND	ND	ND
ndeno(1,2,3-c,d)pyrene	35.0 mg/kg	ND	ND	ND	ND	ND
laphthalene	0.200 mg/kg	ND	ND	ND	ND	ND
henanthrene	98.0 mg/kg	ND	ND	ND	ND	ND
Pyrene	140. mg/kg	ND	ND	ND	ND	ND

ND - Non-Detect mg/kg - milligrams per kilogram

Table 4-1 Analytical Results for Soil Samples Former UST 701 Site 399 Turnbull Avenue, North Charleston SC

SAMPLE NUMBER		NBCT701S150106
Associated Trip Blank		SPORT0649-1
ANALYTE:	RBSLs	
Benzene	0.007 mg/kg	ND
Ethylbenzene	1.50 mg/kg	ND
Toluene	1.70 mg/kg	ND
Xylenes (total)	44.0 mg/kg	ND
Naphthalene	0.200 mg/kg	ND
Acenaphthene	20.0 mg/kg	ND
Acenaphthylene	20.0 mg/kg	ND
Anthracene	430. mg/kg	ND
Benzo(a)anthracene	0.700 mg/kg	ND
Benzo(a)pyrene	4.00 mg/kg	ND
Benzo(b)fluoranthene	0.660 mg/kg	ND
Benzo(ghi)perylene	98.0 mg/kg	ND
Benzo(k)fluoranthene	4.60 mg/kg	ND
Chrysene	0.660 mg/kg	ND
Dibenzo(a,h)anthracene	2.60 mg/kg	ND
Fluoranthene	98.0 mg/kg	ND
Fluorene	16.0 mg/kg	ND
ndeno(1,2,3-c,d)pyrene	35.0 mg/kg	ND
Naphthalene	0.200 mg/kg	ND
Phenanthrene	98.0 mg/kg	ND
Pyrene	140. mg/kg	ND

ND - Non-Detect mg/kg - milligrams per kilogram

Table 4-2 Analytical Results for Surface Soil Samples
Former UST 701 Site
399 Turnbull Avenue, North Charleston SC

SAMPLE NUMBER		NBCT701S110101	NBCT702S120101	NBCT701S130101	NBCT701S140101	
Associated Trip Blank		SPORT0628-1	SPORT0628-1	SPORT0628-1	SPORT0628-1	
ANALYTE:	RBSLs					
Acenaphthene	4700 mg/kg	ND ,	ND	ND	ND	
Acenaphthylene	4700 mg/kg	ND	ND	ND	ND	
Anthracene	23000 mg/kg	ND	ND	ND	ND	
Benzo(a)anthracene	0.880 mg/kg	ND	ND	ND	ND	
Benzo(a)pyrene	0.088 mg/kg	ND	ND .	ND	ND	
Benzo(b)fluoranthene	0.880 mg/kg	ND	ND	ND	ND	
Benzo(ghi)perylene	3100 mg/kg	ND	ND	ND	ND	
Benzo(k)fluoranthene	8.80 mg/kg	ND	ND	ND	ND	
Chrysene	88.0 mg/kg	ND	ND	ND	ND	
Dibenzo(a,h)anthracene	0.088 mg/kg	ND	ND	ND.	ND	
Fluoranthene	3100 mg/kg	ND	ND	ND	ND	
Fluorene	3100 mg/kg	ND	ND	ND	ND	
ndeno(1,2,3-c,d)pyrene	0.880 mg/kg	ND	ND	ND	ND	
Naphthalene	3100 mg/kg	ND	ND	ND	ND	
Phenanthrene	3100 mg/kg	ND	ND	ND	ND	
Pyrene	2300 mg/kg	ND	ND	ND	ND	

ND - Non-Detect

Shaded Areas - DL exceeds soil ingestion/dermal contact RBSL or RBC

#### 5.0 CONTAMINATION ASSESSMENT CONCLUSIONS

The contamination assessment of the former UST 701 site failed to detect contamination above SCDHEC RBSLs. Three of four surface soil samples had DLs elevated above RBSLs. The following paragraphs summarize the conclusions of this contamination assessment investigation.

- No COCs were detected above groundwater protection RBSLs. Analysis of soil samples taken from borings made at the approximate location where COCs were found during UST removal failed to detect any COC either at the level of the tank base or the water table. Based on these results, the former UST 701 site is not a threat to groundwater quality.
- Groundwater was not characterized at the former UST 701 site because no COC was detected at the site in excess of groundwater protection RBSLs, making the likelihood of groundwater contamination negligible.
- Analysis of surface soil samples failed to detect any COC. Three of four samples had DLs elevated above residential ingestion/dermal contact RBSLs for Dibenzo(ah)anthracene and the residential soil ingestion RBC for Benzo(a)pyrene. However, detection of Dibenzo(ah)anthracene at the NAVBASE has been extremely rare. Benzo(a)pyrene, while fairly common at the NAVBASE, is usually accompanied by other COCs, particularly Pyrene and Phenanthrene, at higher concentrations. With no PAH detected in any surface soil sample, the possibility that Dibenzo(ah)anthracene or Benzo(a)pyrene is present in surface soils at the former UST 701 site is negligible. Surface soils at the former UST 701 site are not a threat to site residents.

# **6.0 RECOMMENDATIONS**

Based on the findings of the Contamination Assessment of the former UST 701 site, the Navy recommends no further action for this site.

## 7.0 PROFESSIONAL REVIEW CERTIFICATION

The contamination assessment contained in this report was prepared using sound engineering principles and judgment. This assessment is based on the field investigation and associated information detailed in text and appended to this report. If conditions are determined to exist that differ from those described the undersigned engineers should be notified to evaluate the effects of any additional information on the assessment described in this report. This Contamination Assessment was developed for the former UST site located at Quarters Building 708, 1468 Hobson Avenue, North Charleston SC and applies only to that site:

FREFAREK.	1/1/1/202
	S. T. Beale
	Project Engineer
REVIEWER:	Canth
	C. F. Militzer PE
	P. E. South Carolina No. 17638
	5-26-98
	Date

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#### REFERENCES

Charleston Naval Shipyard Public Works Drawing H409-72 "Storm Drainage - Area No. 2" dated April 3, 1975

Ensafe/Allen & Hoshall, Final Comprehensive Sampling and Analysis Plan (CSAP) RCRA Facility Investigation dated August 30, 1994

Ensafe/Allen & Hoshall, Final RFI Report CTO-0029, Zone B dated November 21, 1996

Ensafe/Allen & Hoshall, Draft Zone I RCRA Facility Investigation Report NAVBASE Charleston dated January 1996

Ensafe/Allen & Hoshall, Final RCRA Facility Investigation Report for Zone H Naval Base Charleston dated July 5, 1996

SCDHEC Underground Storage Tank Assessment Guidelines for Permanent Closure, Change-in Owner and Change-in-Service dated June 1995

SCDHEC Risk-Based Corrective Action for Petroleum Releases dated June 20, 1997

SCDHEC letter dated September 2, 1997, (Paul Bristol to J. T. Amey) "Re: Soil Corrective Action Plan/Response to Comments dated July 30, 1997"

South Carolina R. 61-71 South Carolina Well Regulations and Standards

South Carolina R61-58.5 Maximum Contaminant Levels in Drinking Water

Base Realignment and Closure Tank Management Plan Charleston Naval Complex, Charleston SC

Soil Corrective Action Plan for Excavated Soil from Underground Storage Tanks (Bioremediation Study) Naval Base Charleston, Charleston SC dated January 28, 1997.

Underground Storage Tank Assessment (UST) Assessment Report for Charleston Naval Base Complex, NS 701, Dated 30 September 1996

United States Environmental Protection Agency (USEPA) Environmental Services Division Standard Operating Procedures and Quality Assurance Manual (SOPQAM)

United States Environmental Protection Agency (USEPA)Region III RBC Table dated September 23, 1996

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399 TURNBULL AVENUE   WATER LEVEL   11' BGS   TIME   TIME	EN	VIR		IENTA			НМЕ	EN	Т	JOB ORDER:	T-SAP 701	CLIENT: SO	DUTHDIV
SOIL BORING LOG  HAND AUGER  SHEET 1 OF 1  SAMPLIN METHOD:  BORING  SARB  START FINIS  START FINIS  WATER LEVEL 11'BGS  TIME 1050 1050 1050  LEVATION: 15.57 ft. msl  SAMPLE CONDITIONS: SANDY SOIL, SPARSE  GRAS  SAMPL LIGHT GRAYISH TAN IN COLOR - NO ODOR  SAMPLE NBCIT7103080103  SAND - LIGHT GRAYISH TAN IN COLOR - NO ODOR  SAMPLE NBCIT7103080103  SAND - LIGHT GRAYISH TAN IN COLOR - NO ODOR  SAMPLE NBCIT7103080103  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDIUM GRAYISH TAN IN COLOR - NO ODOR  SAND - MEDI										DRILLING ME	HOD.	BODING NO	701000
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COCATION OF BORING: CLUARTERS BUILDING 701   399 TURNBULL AVENUE   111 BGS   11050   1005   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050   10050													
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ORTHING: 377705.70								294	.05		. 11' BGS	TIME	TIME
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1	TYPE TYPE	RECO	DEPTH OF CASING	SAMPLE NO SAMPLE DEPTH	BLOWS/FT SAMPLER	OVA READING (PPM)			SOIL GRAPH		NDITIONS: SA	ANDY SOIL, SPA	RSE
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CHK BY:

G:	SOII	NORTI	RING	LOG BUILDI L AVEN	UE			DRILLING METH HAND AUGER SAMPLING MET GRAB		BORING NO SHEET 1 OF BORING	
G: DN:	377692 14.99 ft	IG: QUA 399 TL NORTI	ARTERS JRNBUL H CHAR	BUILDI L AVEN	UE			HAND AUGER SAMPLING MET		SHEET 1 OF	
G: DN:	377692 14.99 ft	IG: QUA 399 TL NORTI	ARTERS JRNBUL H CHAR	BUILDI L AVEN	UE		·	SAMPLING MET	HOD:		<del>-</del> 1
G: DN:	377692 14.99 ft	399 TL NORTI	JRNBUL H CHAR	L AVEN	UE			4	HOD:	BORING	
G: DN:	377692 14.99 ft	399 TL NORTI	JRNBUL H CHAR	L AVEN	UE			IGRAR			
ON:	14.99 ft	NORTI	H CHAR	LESTO						START	FINISH
ON:	14.99 ft	.47			100	204	105	WATER LEVEL	10' BGS	TIME	TIME
ON:	14.99 ft	msi	EASTI	NG:				TIME	1335	1300	1335
		o. /			2316	636	7.93	DATE	23-Mar-98	DATE	DATE
N. RECOVERED	TH OF SING	ON /						CASING DEPTH		23-Mar-98	23-Mar-9
<del></del>	DEP	SAMPLE NO. SAMPLE DEPTH	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTHIN	_	SOIL GRAPH	SURFACE CON GRASS	DITIONS: SAND	DY SOIL, SPAI	RSE
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			HARL						DRILLING METH	OD:	BORING NO	701510
		SOII	L BOF	RING	LOG				HAND AUGER		SHEET 1 OF	
									SAMPLING MET	HOD:	BORING	
LOCA	TION O	BORIN	IG: QUA	RTERS	RIIIDI	NG 70	1		GRAB		START	FINISH
2007		DOM			L AVEN		' 1		WATER LEVEL	10' BGS		
					LESTO		294	05			TIME	TIME
NORTH	IING:	377694	06	EASTI	10.	2240		2.00	TIME	1425	1340	1425
ELEVA		14.96 f		EASTI	NG:	2316	361	0.90	DATE	23-Mar-98	DATE	DATE
LLEVA		14.90 1	. 7		1 (0	_	- 1		CASING DEPTH		23-Mar-98	23-Mar-9
SAMPLER TYPE	IN. DRIVEN	DEPTH OF CASING	SAMPLE NO.	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN		SOIL GRAPH	SURFACE CON GRASS	DITIONS: SAND	DY SOIL, SPAI	RSE
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		SOIL	. BOF	RING	LOG			HAND AUGER	UU.	SHEET 1 OF	
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LOCA	I ION OF	- BOKIN	IG: QUA	IRNBUL				GRAB (SURFAC		START	FINISH
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NODE		077704	70	l= a c=u		200400		TIME		1435	1435
NORTH ELEVA		377704		EASTIN	NG:	23163	60.88	DATE		DATE	DATE
ELEVA		15.09 ft			l (n	1	<del>-</del>	CASING DEPTH		23-Mar-98	23-Mar-
SAMPLER TYPE	IN. DRIVEN	DEPTH OF CASING	SAMPLE NO.	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN FEET		SURFACE CON GRASS			RSE 
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		C	HARL	EST(	NC			DRILLING MET	HOD:	BORING NO	701912
		SOII	L BOF	RING	LOG			HAND AUGER	100.	SHEET 1 OF	•
								SAMPLING ME	THOD:	BORING	
LOCA	TION OF	RODIN	IG: QUA	DTEDS	BI III DI	NG 701		GRAB (SURFA		START	FINISH
LOOK	11011 01	DOM			L AVEN			WATER LEVEL		TIME	TIME
			NORTI	H CHAR	LESTO	N SC 2	9405	TIME	N/A	1440	1440
NORTH	IING:	377707	7 14	EASTI	NG.	23163	50 37	DATE		DATE	DATE
ELEVA		15.19 ft		3.0	10.	20.00	00.01	CASING DEPTH	1	23-Mar-98	1
SAMPLER TYPE	IN DRIVEN	DEPTH OF CASING	SAMPLE NO.	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN FEET	SOIL GRAPH	SURFACE CO GRASS	NDITIONS: SAI	NDY SOIL, SPAI	RSE
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		C	HARL	EST	NC				DRILLING METH	IOD.	BORING NO	701S13
		SOII	L BOF	RING	LOG				HAND AUGER	.00.	SHEET 1 OF	
									SAMPLING MET	HOD:	BORING	<del>'</del>
LOCA	TION O	E BORIN	NG: QUA	RTERS	BUILD	NG 70	1		GRAB (SURFAC		START	FINISH
LOOM	1101101	DOM			L AVEN		•		WATER LEVEL	N/A	TIME	TIME
					LESTO		940	05	TIME	IVA	1445	1445
NORTH	IING:	377702	76	EASTI	NG.	2316	350	12	DATE		DATE	DATE
ELEVA		15.11 f		2,0		2010	-	. 12	CASING DEPTH		23-Mar-98	23-Mar-
SAMPLER	IN. DRIVEN	DEPTH OF CASING	SAMPLE NO.	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN		SOIL GRAPH	SURFACE CON GRASS	IDITIONS: SAN		
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			HARL						DRILLING METH	IOD:	BORING NO	701S14
		SOII	L BOF	RING	LOG				HAND AUGER		SHEET 1 OF	
									SAMPLING MET	HOD:	BORING	•
LOCATIO	ON OF	BORIN	IG: QUA	RTERS	BUILDI	NG 70	)1		GRAB (SURFAC		START	FINIS
			399 TL	JRNBUL	L AVEN	UE			WATER LEVEL	N/A	TIME	TIME
			NORTI	H CHAR	LESTO	V SC	2940	5	TIME	107	1450	1450
NORTHIN	IG:	377704	.89	EASTI	NG:	2316	357	70	DATE		DATE	DAT
ELEVATION	ON:	15.22 ft	t. msi			1=0.0			CASING DEPTH		23-Mar-98	23-Mar
SAMPLER TYPE	IN. RECOVERED	DEPTH OF CASING	SAMPLE NO.	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN		SOIL GRAPH	SURFACE CON GRASS		IDY SOIL, SPAF	
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		SOIL	_ BOF	RING	LOG				HAND AUGER		SHEET 1 O	
									SAMPLING MET	HOD:	BORING	
LOCA	TION OF	BORIN	IG: QUA	RTERS	BUILDE	NG 701	1		GRAB		START	FINIS
,		50		JRNBUL			•		WATER LEVEL	12' BGS	TIME	TIME
			NORTI	H CHAR	LESTO	1 SC 2	940	05	TIME	1015	┥ '''''	1015
NORTH	IING:	377702	05	EASTI	ıc.	23163	362	00	DATE	8-Apr-98	DATE	DATE
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SAMPLER	IN. DRIVEN	DEPTH OF CASING	SAMPLE NO.	BLOWS/FT SAMPLER	OVA READING (PPM)	DEPTH IN FEET		SOIL GRAPH	SURFACE CON GRASS	DITIONS: SAN	IDY SOIL, SPA	<u> </u>
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Page | of |

General Engineering Lab 2040 Savage Road Charleston, South Carolin. P.O. Box 30712 **CHAIN OF CUSTODY RECORD** Charleston, South Carolina 29417 (803) 556-8171

fories, Inc.

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Client Name/Facility N				,	- 1	$\vdash$	SAI	MPLE	ANAL	YSIS	REQU	IRED	(x) - u	se rema	rks area	to spec	ify spec	ific cor	npounc	s or me	thods		Use F or P in the boxes to indicate whether
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SAMPLE ID	DATE	TIME	WEL	SOIL	GRAB # OF CONTAINERS	pH. conductivity	TOC/DOC	TOX	Chloride, Fluoride, Sulfide	Nitrite/Nitrate	VOC - Specify Method required	METALS - specif	Pestic	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	BT EX/NA	PA	Remarks
SPORT 6625-1	3/20/9	x 1093d		y L	11/																V		Soil TRIP BLOOK
SPORTUGES-2	3/20/98	1000		1	V 3																V	V	NS 701-150:1
SPORTPUZS-3	3/24/98	1345		1	12																V		NS 701-2 SO.1
SPORTU625-L	3/20/98	\$ 6934		4	1,2																		NS 701-3 Soil
SPORT & 625-5	3/20/9	1635		i	12	-																	NS 701-4 So,1
SPORT\$ 625-6		1	11	11	1/2	-																	NS 201-5 Soil
SPORT \$625-7	3/20/98	14 64			V 2															_	~	V	NS 701-6 Soil
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Kelinquished by:		Date:	Tim	ie:	Reco	ived b	y lab b	y:	· × · ·	1	9	•	Date:	1	Time:	<i>,</i> L.	Remai	rks	1.	\$	1491	7 ¥ V.	244 Marxani Detrecto

## **CHAIN OF CUSTODY RECORD**

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# **CHAIN OF CUSTODY RECORD**

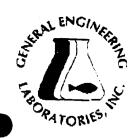
General Engineering La' ies, Inc. 2040 Savage Road
Charleston, South Carolin. 2407
P.O. Box 30712
Charleston, South Carolina 29417
(803) 556-8171

Client Name/Facility N	ame				<del></del>	<b>T</b>	T	SAN	1PLE	ANAL.	YSIS	REQU	IRED	(x) · u	se rema	rks area	to spec	ify spec	ific con	noone.	ls or me	thods		Υ	1 E 61			. ,
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Collected by/Company						ONTAINERS	pH, conductivity	2		Chloride, Fluoride, Sulfide	litrate	VOC - Specify Method required	S - specify		٠	enol	ractables	actables			Coliform - specify type	/VAP	H					
SAMPLE ID	DATE	TIM	E	WELL	COMP	# OF CC	pH, con	TOC/DOC	rox	Chloride Sulfide	Nitrite/Nitrate	VOC - S Method	METALS.	Pesticide	Herbicide	Total Phenol	Acid Extractable	B/N Extrac	PCB's	Cyanide	Coliform type	BFEX	Ad			Rema		
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SFUATU 628-7	3/23/98	144	0		1	1)													_				Х	MB.	CT T	OIS	1201	0/
SPORT16628-8	•			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	1   r	11																	X	NB	C-7	70/S	1301	01
SPORT \$628-9	3/23/98	145	0	1		1/																	X	NB	CT ;	7015	1401	01
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Relinquished by:		Date:		Time		Recei	ived by	y:			1			Reline	quishe	d by:					_	Date:		Time:	Receive	d by:		
Relinquished by:	-	3/24/ Date:	98	O8 Time	40	Recei	2'YAV ived by	lab b	<u>Va</u> y:	21v	r k	<b>`</b>		Date:		Time:		Rema	rks:			-						
	l	<u> </u>				L																						

Page \_\_\_\_ of \_\_\_\_

Table C-1
Sample Cross-Reference List
Quarters Building 701
399 Turnbull Avenue
North Charleston South Carolina

DET Laboratory No.	Intermediate No. (where used)	Report Sample Identification No.
SPORT0625-1	SOIL TRIP BLANK	
SPORT0625-2	701-1	NBCT701S010103
SPORT0625-3	701-2	NBCT701S020103
SPORT0625-4	701-3	NBCT701S030103
SPORT0625-5	701-4	NBCT701S040103
SPORT0625-6	701-5	NBCT701S050103
SPORT0625-7	701-6	NBCT701S060103
SPORT0628-1	SOIL TRIP BLANK	
SPORT0628-2		NBCT701S070103
SPORT0628-3		NBCT701S080103
SPORT0628-4		NBCT701S090103
SPORT0628-5		NBCT701S100105
SPORT0628-6		NBCT701S110101
SPORT0628-7		NBCT701S120101
SPORT0628-9		NBCT701S130101
SPORT0628-9		NBCT701S140101
SPORT0641-1	SOIL TRIP BLANK	
SPORT0641-2		NBCT701S150106



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Laboratory Cert

CEL. E\$7156/\$7294 117472/8745%

STATE FL NC SC TN 233 10120 02934

10582 02934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

ce: NPWC00197

Report Date: March 31, 1998

Page 1 of 2

Sample ID Lab ID

: SPORT0625-1

: Soil

Matrix

: 9803508-01

Date Collected

: 03/19/98

Date Received

: 03/20/98

Priority

: Routine

Collector

: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analy	t Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	<b>00.</b> 0	1.00	2.00	ug/kg	1.0	TCL	03/27/98	2203	11909	7 1
Ethylbenzone	U	0.00	1.00	2.00	ug/kg	1.0					
loluene	U	0.00			ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	υ	0.00	1.00	2.00	ug/kg	1.0					

Surrogate Recovery	Test	Percent%	Acceptable Limits	
Bromofluorobenzene	BTEX-8260	86.4	(53.5 - 154.)	
Dibromofluoromethane	BTEX-8260	86.2	(63.4 - 136.)	
Toluene-d8	BTEX-8260	84,6	(72.1 - 137.)	
Bromofluorobenzene	NAP-8260	86.4	(53.5 - 154.)	
Dibromofluoromethane	NAP-8260	86.2	(63.4 - 136.)	
Tolnene-d8	NAP-8260	84.6	(72.1 - 137.)	

M = Method	Method-Description

M 1

**EPA 8260** 

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+9803508-01\*



### GENE

## **ENGINEERING LABORATORIES**

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Laboratory Certifications

 STATE
 GPL
 EPI

 FL
 E87156/K7294
 E87472/87458

 NC
 233

 SC
 10120
 10582

 TN
 02934
 02934

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: March 31, 1998

Page 2 of 2

Sample 1D

: SPORT0625-1

M = Method

Method-Description

#### Notes:

The qualificrs in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed a accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

•

Reviewed By

PO Box 30712 · Charleston, SC 29417 · 2040 Savage Road · 29414

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**\*9803508-01\*** 



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STATE GEL. FL EST1: NC 233 SC 10120 TN 02934 EP1 E87472/87458 E57136/67294

10120

10582 02934

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

œ: NPWC00197

Report Date: March 31, 1998

Page 1 of 2

Sample ID Lab ID

: SPORT0625-2

Matrix

: 9803508-02

Date Collected

: Sail : 03/19/98

Date Received

: 03/20/98

Priority

: Routine

Collector

: Client

Parameter	Qualifier	Result	DL	RL	Unite	DF	Annh	rat Date	Time	Batch	M
Volatile Organics		<del></del>	<del></del>								
BTEX - 4 items											
Benzene	ប	0.00	1.00	2.00	ug/kg	1.0	TCL	03/27/98	2305	119097	7 1
Ethylbenzene	Ų	0.00	1.00	2.00	ug/kg	1.0					-
Colvens	Ū	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	ប	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	ប	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics				-	~ 0						
Polynuclear Aromatic	Hydrocarbons -	16 items									
Acenaphthene	ับ	0.00	167	333	ng/kg	1.0	JРA	03/25/98	0107	118787	7 2
Acenaphthylene	Ų	0.00	167	33 <b>3</b>	ug/kg	1.0		,			
Anthracene.	ប	0.00	167	333	ug/kg	1.0					
Benzo(1)anthracene	ប	0.00	167	333	ug/kg	1.0					
Benzo(1)pyrene	ប	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	บ	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	ប	0.00	167	333	ug/kg	1.0					
Chrysena	ប	0.00	167	3 <b>33</b>	ug/kg	1.0					
Dibenzo(a.h)anthracen	e V	0.00	167	333	ug/kg	1.0					
Fluoranthene	Ū	0.00	167	333	ug/kg	1.0					
Fluorene	บ	0.00	167	333	ng/kg	1.0					
Indeno(1,2,3-c,d)pyren	e U	0.00	167	333	ug/kg	1.0					
Naphthalene	บั	0.00	167	333	ug/kg	1.0					
Phonanthrone	Ū	0.00	167	333	ug/kg	1.0					
Pyrene	Ü	0.00	167	333	ug/kg	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

RDH 03/23/98 1200 118787 3

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Laboratory Cortifla STATE FL NC SC TN CEL. E17156/87294 E87472/87438

10582 02934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Habson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

c: NPWC00197

Report Date: March 31, 1998

Page 2 of 2

	Sample ID	: SPORT0625	• <b>2</b>	
Surrogate Recovery	Test	Percent%	Acceptable Limits	
2-Fluorobiphenyl	M610	75.7	(30.0 - 115.)	
Nitrobenzene-d5	M610	77.5	(23.0 - 120.)	
p-Terphenyl-d14	M610	85.8	(37.3 - 128.)	
Bromoffuorobenzene	BTEX-8260	86.2	(53.5~154.)	
Dibromofluoromatisme	BTEX-8260	86.4	(63,4 - 136,)	
Toluenc-d8	BTEX-8260	85.2	(72.1 - 137.)	
Bromofluorobenzene	NAP-8260	86.2	(53.5 - 154.)	
Dibromofluoromethane	NAP-8260	86.4	(63,4 - 136.)	
Toluene-d8	NAP-8260	85.2	(72.1 - 137.)	

M = Method	Method-Description	
M 1 M 2 M 3	EPA 8260 EPA 8270 EPA 3550	

### Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

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\*9803508-02\*



<sup>\*</sup> indicates that a quality control analyte recovery is outside of specified acceptance criteria.



## GENERAL ENGLOSSING LABORATORIES

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Laboratory Cartifications

STATE CEL MPI E87472/87458 FL NC SC E87156/87294 233 10120 10582 02934

Client:

Supervisor of Ship Building & "

SUPSHIP-Portsmouth Detach:

-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

œ: NPWC00197

Report Date: March 31, 1998

: 9803508-03

Page 1 of 2

Sample ID الله الما

: SPORT0625-3

Marrix

: Soil

Date Collected

: 03/19/98

Date Received

: 03/20/98

Priority

: Routine

Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst Date Time	Butch M
Volatile Organics					·		<del></del>	
BTEX - 4 items								
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	TCL 03/28/98 0007	119097 1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0		
'oluene	U	0.00	1.00	2.00	ug/kg	1.0		
Xylenes (TOTAL)	ប	0.00	1.00	4.00	ug/kg	1.0		
Naphthalene	ប	0.00	1.00	2.00	ug/kg	1.0		
Extractable Organics					<i>D</i> 0			
Polynuclear Aromatic H	lydrocarbons -	16 items						
Acenephthene	ប	0.00	167	333	ug/kg	1.0	JPA 03/25/98 0139	118787 2
Acenaphthylene	Ü	0.00	167	333	ug/kg	1.0		
Anthracene	ប	0.00	167	333	ug/kg	1.0		
Benzo(a)anthracene	ប	0.00	167	333	ug/kg	1.0		
Benzo(#)pyrene	U	0.00	167	333	ug/kg	1.0		
Benzo(b)fluoranthene	ប	0.00	167	333	ug/kg	1.0		
Benzo(ghi)perylene	Ŭ	0.00	167	333	ug/kg	1.0		
Bonzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0		
Chrysene	ប	0.00	167	333	ug/kg	1.0		
Dibenzo(a,h)anthracene	U	0.00	167	333	ug/kg	1.0		
Fluoranchene	Ū	0.00	167	333	ug/kg	1.0		
Fluorene	U	0.00	167	333	ug/kg	1.0		
Indeno(1,2,3-c,d)pyrene	U	0.00	167	333	ug/kg	1.0		
Naphthalene	ប	0.00	167	333	ug/kg	1.0		
Phenanthrene	ប	0.00	167	333	ug/kg	1.0		
Pyrene	U	0.00	167	333	ug/kg	1.0		

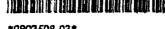
The following prep procedures were performed:

GC/MS Base/Neutral Compounds

RDH 03/23/98 1200 118787 3

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STATE
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NC
SC
TN ŒL E\$7156/87294 E87472/87458 233 10120 105¥2 02934

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

∞: NPWC00197

Report Date: March 31, 1998

Page 2 of 2

	Sample ID	: SPORT0625-3	
Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	79.4	(30.0 - 115.)
Nitrobenzene-d5	M610	81.3	(23.0 - 120.)
p-Terphenyl-d14	M610	85.7	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	86.6	(53.5-, 154.)
Dibromofluoromethane	BTEX-8250	85.8	(63.4 - 136.)
Toluenc-d8	BTEX-8260	83.0	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	86.6	(53.5 - 154.)
Dibromofluoromethene	NAP-8260	85.8	(63.4 - 136.)
Toluene-d8	NAP-8260	83.0	(72.1 - 137.)

M = Method	Method-Description	
M 1	EPA 8260	
M 2	EPA 8270	Companies to the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Companies of the Compan
M 3	EPA 3550	•

### Notes:

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ND indicates that the analyte was not detected at a concentration greater than the detection limit.

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(803) 556-8171 • Fax (803) 766-1178

\*9803508-03\*



indicates that a quality control analyte recovery is outside of specified acceptance criteria.



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Laboratory Certifications

STATE GEL FL ES71: NC 233 SC 10120 TN 02934 EPI E17472/17451 E17156/17294 10120 10582

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detechment

cc: NPWC00197

Report Date: March 31, 1998

Page 1 of 2

Sample ID

Lab ID

: SPORT0625-4 : 9803508-04

Matrix

: Soil

Date Collected

: 03/20/98

Date Received

: 03/20/98

Priority

: Routine

Callaca

: Client

	Conecum		: CII
arameter	Qualifier	Result	

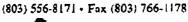
Parameter	Qualifier	Result	DL	RL	Units	DF	Analy	st Date	Time	Batch M	
Volatile Organics											
BTEX - 4 items											
Benzanc	U	0.00	1.00	2.00	ug/kg	1.0	TCL	03/28/98	0039	119097 1	
Ethylbenzene	Ū	0.315	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.807	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics					J	_					
Polynuclear Aromatic	Hydrocarbons -	16 items									
Acennphihene	ប	0.00	166	331	ug/kg	1.0	JPA	03/25/98	0211	118787 2	
Acenaphthylene	U	0.00	166	331	ug/kg	1.0					
Arthracene	U	0.00	166	331	ug/kg	1.0					
Bcnzo(a)andracene	บ	0.00	166	331	ug/kg	1.0					
Benzo(a)pyrena	ប	0.00	166	331	ug/kg	1.0					
Benzo(b)fluoranthene	บ	0.00	166	331	ug/kg	1.0					
Benzo(ghi)perylene	Ų	0.00	166	331	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	166	331	ug/kg	1.0					
Chrysene	บ	0.00	166	331	ug/kg	1.0					
Dibenzo(a,h)anthracen	e Ų	0.00	166	331	ug/kg	1.0					
Fluoranthena	U	0.00	166	331	ug/kg	1.0					
Fluorena	U	0.00	166	331	ug/kg	1.0					
Indeno(1,2,3-c,d)pyren	ıc Ü	0.00	166	331	ug/kg	1.0					
Naphthalene	U	0.00	166	331	ug/kg	1.0					
Phenanthrene	U	0.00	166	331	ug/kg	1.0					
Ругеле	U	0.00	166	331	ug/kg	1.0					

The following prep procedures were performed:

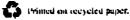
GC/MS Base/Neutral Compounds

RDH 03/23/98 1200 118787 3

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\*9803508-04\*





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STATE GEL EFT E87472/8745k E87156/87294 10120 10582 02924

Client

Supervisor of Ship Building & Conversion SUPSHIP-Portamonth Detachment-Env.

1899 North Hobson Avc.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: March 31, 1998

Page 2 of 2

	Sample ID	: SPORT0625	<b>-4</b>
Serrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	88.1	(30.0 - 115.)
Nitrobenzene-d5	<b>M61</b> 0	89.2	(23.0 - 120.)
p-Terphenyl-d14	M610	92.7	(37.3 - 128.)
Bromofluorobenzene	BTEX-8260	87.2	(53.5—154.)—————
Dibromofluoromethane	BTEX-8260	90.2	(63.4 - 136.)
Toluene-d8	BTEX-8260	84.A	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	87.2	(53.5 - 154.)
Dibromofluoromethane	NAP-8250	90.2	(63.4 - 136.)
Toluene-d8	NAP-8260	84.4	(72.1 - 137.)

M = Method	Method-Description	
M 1	EPA 8260	
M 2	EPA 8270	a barto i e custos del i uso committan i de a de mando del il e i i i
M 3	EPA 3550	

#### Notes:

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I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

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\*9803508-04\*



<sup>\*</sup> indicates that a quality control analyte recovery is outside of specified acceptance criteria.



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Laboratory Cartificutions

 STATE
 GEL
 EPf

 FL
 E37156/87/294
 E87472/87458

 NC
 233

 SC
 10120
 10582

 TN
 02934
 02934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

œ: NPWC00197

Report Date: March 31, 1998

Page 1 of 2

Sample ID
Lab ID

: SPORT0625-5

Maurix

: 9803508-05

Date Collected

: Soil : 03/20/98

Date Received

: 03/20/98

Priority

: Routine

Collector

: Client

Porameter	Qualifier	Result	DL	RL	Units	DF	Analyst Date	Time	Batch	M
Volatile Organics										
BTEX - 4 items										
Benzene	ប	0.00	1.00	2.00	ug/kg	1.0	TCL 03/30/98	1708	119097	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0				•
Coluene	<b>U</b>	0.00	1.00	2.00	ng/kg	1.0				
Xylenes (TOTAL)	ប	0.00	1.00	4.00	ug/kg	1.0				
Naphthulene	ប	0.00	1.00	2.00	ug/kg	1.0				
Extractable Organics					<b>4</b> -5					
Polynuclear Aromatic I	iydrocarbons •	16 items								
Acenaphthene	U	0.00	167	333	ug/kg	1.0	IPA 03/25/98	0243	118787	2
Acenephthylene	U	0.00	167	333	ug/kg	1.0				
Anthracene	U	0.00	167	333	ug/kg	1.0				
Benzo(a) unthracena	U	0.00	1 <b>67</b>	333	ug/kg	1.0				
Benzo(a)pyrene	U	0.00	167	33 <b>3</b>	ug/kg	1.0				
Benzo(b)fluoranthene	Ų	0.00	1 <b>67</b>	33 <b>3</b>	ug/kg	1.0				
Bonzo(ghi)perylene	Ų	0.00	167	333	ug/kg	1.0				
Benzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0				
Chrysene	ប	0.00	167	333	πā∖jcā	1.0				
Dibenzo(a,h)anthracens	: U	0.00	167	333	ug/kg	1.0				
Fluoranthene	U	0.00	167	333	ug/kg	1.0				
Fluorene	U	0.00	167	333	ug/kg	1.0				
Indeno(1,2,3-c,d)pyrene	· U	0.00	167	333	ug/kg	1.0				
Naphthalene	ŭ	0.00	167	333	ug/kg	1.0				
Phenanthrene	Ū	0.00	167	333	ug/kg	1.0				
Pyrene	U	0.00	167	333	ug/kg	1.0				

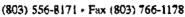
The following prep procedures were performed:

GC/MS Base/Neutral Compounds

RDH 03/23/98 1200 118787 3

+9803508-05\*

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Meeting today's needs with a vision for tomorrow.

STATE OFL FL 8871 NC 233 SC 101.2 IN 0293 EP1 EN7472/87458 B\$71.56/07294 10502 101.20 02934

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detechment

cc: NPWC00197

Report Date: March 31, 1998

Page 2 of 2

	Sample ID	: SPORT0625	-5	
Surrogate Recovery	Test	Percent%	Acceptable Limits	· <del></del>
2-Fluorobiphenyl	M610	78.8	(30.0 - 115.)	<del></del>
Nitrobenzene-d5	M610	78.9	( <b>23.0</b> - 120.)	
p-Terphenyi-d14	M610	86.5	(37.3 - 128.)	
Bromolluorobenzene	BTEX-8260	99.2	(53.5-154.)	
Dibromofluoromethana	BTEX-8260	85.6	(63.4 - 136.)	
Toluene-d8	BTEX-8260	82.0	(72.1 - 137.)	
Bromofluorobenzene	NAP-8260	99.2	(53.5 - 154.)	
Dibromofluoromethane	NAP-8260	85.6	(63.4 - 136.)	
Toluene-d8	NAP-8260	82.0	(72.1 - 137.)	

M = Method	Method-Description
M 1	EPA 8260
M 2	EPA 8270
M 3	EPA 3550

### Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyze at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct

any questions to your Project Manager, Karen Blakency at (803) 769-7386.

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29414

(803) 556-8171 · Fax (803) 766-1178

\*9803508-05\*



<sup>\*</sup> indicates that a quality control analyte recovery is outside of specified acceptance criteria.



Meeting today's needs with a vision for tomorrow.

STATE GEL EPI E87472/87458 FL NC SC IX E87156/87294 233 10120 10512

Client:

Supervisor of Ship Building & Conversion SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

c: NPWC00197

Report Date: March 31, 1998

Page 1 of 2

02934

Sample ID

: SPORT0625-6

Lab ID Matrix

:9803508-06

Date Collected

: Soil

: 03/20/98

Date Received

: 03/20/98

Priority

: Routine

Collector

: Client

Parameter	Qualifier	Result	DL	RI.	Units	DF	Anaiysi	Date	Time	Butch	
Volatile Organics							ZZZAJYBI	Date	TIME	Duten	MI
BTEX - 4 items											
Benzens	U	0.00	1.00	2.00							
Ethylbenzene	Ū	0.00	1.00	2.00	ng/kg	1.0	TCL 0	3/28/98	0141	119097	1
. oluene	Ū	0.00	1.00	2.00	ng/cg	1.0					
Xylenes (TOTAL)	ับ	0.00		2.00	ng/kg	1.0					
Naphthalene	Ū	0.00	1.00	4.00	na/ka	1.0					
Extractable Organics	ū	0.00	1.00	2.00	ug/kg	1.0					
Polynuclear Aromatic H	lydrocarbons.	16 itams									
Acenaphthene	Ų	0.00	166								
Acenaphthylene	Ü	0.00	166	332	ug/kg	1.0	JPA 0	3/25/98	0315	118787	2
Anthrecene	Ü	0.00	166	332	ug/kg	1.0					
Benzo(a)anthracene	Ŭ	0.00	166	332	ug/kg	1.0					
Bcnzo(a)pyrcne	Ü	0.00	166	332	ug/kg	1.0					
Benzo(b)fluoranthene	ŭ	0.00	166		ug/kg	1.0					
Benzo(ghi)perylene	Ü	0.00	166		ug/kg	1.0					
Benzo(k)fluoranthene	ŭ	0.00	166		ug/kg	1.0					
Chrysene	ŭ	0.00	166		ug/kg	1.0					
Dibenzo(a,h)anthracene		0.00	166		ug/kg	1.0					
Fluoranthene	Ü	0.00	166		ug/kg	1.0					
Fluorene	บ	0.00	166		ng/kg	1.0					
Indeno(1,2,3-c,d)pyrene		0.00	166		ug/kg	1.0					
Naphthalene	Ü	0. <b>00</b>	166		ug/kg	1.0					
Phenanthrene	Ü	0.00	166		ug/kg	1.0					
Pyrene	Ü		166		ne/kg	1.0					
	U	0.00	166	332	ug/kg	1.0					

The following prep procedures were performed: GC/MS Base/Neutral Compounds

RDH 03/23/98 1200 118787 3

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**\*98035**08-06\*





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Laboratory Certifications

STATE CHL EPI E87156/87294 E87472/87458 10582 02934

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

œ: NPWC00197

Report Data: March 31, 1998

Page 2 of 2

	Sample ID	: SPORT0625	-6	
Surrogute Recovery	Test	Percent%	Acceptable Limits	
2-Fluorobiphenyl	M610	79.0	(30.0 - 115.)	
Nitrobenzene-d5	M610	80.9	(23.0 - 120.)	
p-Terphonyl-d14	M610	85.5	(37.3 - 128.)	
Bromofluorobenzene	BTEX-8260	86.6	(53.5 - 154.)	
Dibromofluoromethane	BTEX-8260	87.6	(63.4 - 136.)	
Toluenc-d8	BTEX-8260	85.2	(72.1 - 137.)	
Bromofluorobenzene	NAP-8260	86.6	(53.5 - 154.)	
Dibromofluoromethane	NAP-8260	87.6	(63.4 - 136.)	
Toluene-d8	NAP-8260	85.2	(72.1 - 137.)	

M = Method	Method-Descrip	tion
M 1	EPA 8260	
M 2	EPA 8270	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s
M 3	EPA 3550	

#### Notes:

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ND indicates that the analyte was not detected at a concentration greater than the detection limit

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct

any questions to your Project Manager, Knren Blakeney at (803) 769-7386.

PO Box 30712 · Charleston, SC 29417 · 2040 Savage Road · 29414

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\*9803508-06\*



<sup>\*</sup> indicates that a quality control analyte recovery is outside of specified acceptance criteria.



Meeting today's needs with a vision for tomorrow.

Laboratory Certifies

STATE GEL FL E87156/87294 EPI E87472/87458 105¥2 02934

Client:

Supervisor of Ship Building & Conversion SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Ocscription:

SUPSHIP-Portsmouth Detachment

∞: NPWC00197

Report Date: March 31, 1998

Page 1 of 2

Sample ID

: SPORT0625-7 : 9803508-07

Lab ID Matrix

Date Collected

: Soil

Date Received

: 03/20/98

: 03/20/98

: Roucine : Client

Priority Collector

Parameter	Qualifier	Result	DL	RL	Units	DF	Anai	et Date	Time	Batch	M
Volatile Organics											
BTEX - 4 items											
Benzenc	ប	0.00	1.00	2.00	ug/kg	1.0	TCL	03/28/98	0212	11909	7 1
Ethylbenzene	U	0.00	1.00	2.00	ng/kg	1.0	. 42	02,20,70	42.2		•
Toluene	บ	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics					-9-6						
Polynuciear Aromatic H	lydrocarbons -	16 items									
Acensphthene	U	0.00	167	333	ug/kg	1.0	JPΑ	03/25/98	0347	118787	7 2
Acenephthylene	U	00	167	333	ug/kg	1.0		10,00,00		22070	_
Anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	167	333	ug/kg	1.0					
Banzo(b)fluorenthène	U	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	Ų	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Chrysene	Ų	0.00	167	333	ug/kg	1.0					
Dibenzo(a.h)anthracene	ប	0.00	167	333	ug/kg	1.0					
Fluoranthene	U	0.00	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	ប	0.00	167	333	ug/kg	1.0					
Naphthalene	U	0.00	167	333	ug/kg	1.0					
Phenanthrene	U	0.00	167	333	ug/kg	1.0					
Pyrene	U	0.00	167	333	ug/kg	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

RDH 03/23/98 1200 118787 3

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\*9803508-07\*





Meeting today's needs with a vision for tomorrow.

STATE CIGL FL E87156/87294 NC 233 SC 10120 TN 02834 EP( E87472/87458 10582

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

œ: NPWC00197

Report Date: March 31, 1998

Page 2 of 2

	Sample ID	: SPORT0625	<b>-</b> 7	
Surrogate Recovery	Test	Percent%	Acceptable Limits	
2-Fluorobiphenyl	M610	80.2	(30,0 - 115.)	
Nitrobenzene-d5	M610	82.2	(23.0 - 120.)	
p-Terphenyl-d14	M610	87.1	(37.3 - 128.)	
Bromofluorobenzene	BTEX-8250	8 <b>6.8</b>	(53.5 - 154.)	
Dibromofluoromethane	BTEX-8260	89,4	(63.4 - 136.)	
Toluene-d8	BTEX-8260	84.4	(72.1 - 137.)	
Bromofluorobenzene	NAP-8250	86.8	(53.5 - 154.)	
Dibromofluoromethane	NAP-8260	89.4	(63.4 - 136.)	
Toluene-d8	NAP-8260	84.4	(72.1 - 137.)	

M = Method	Method-Description	
M 1	EPA 8260	
M 2	<b>EPA</b> 8270	 
M 3	<b>EPA</b> 3550	•

#### Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct

any questions to your Project Manager, Karon Blakeney at (803) 769-7386.

P O Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29414

(803) 556-8171 - Fax (803) 766-1178

+9803508-07\*



<sup>\*</sup> indicates that a quality control analyte recovery is outside of specified acceptance criteria.



Meeting today's needs with a vision for tomorrow.

Laboratory Cartification

STATE GEL FL E57156/67294 EPI E87472/87458 FL NC SUN

233 10120 02934

10582 02934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detechment

c: NPWC00197

Report Date: April 02, 1998

Page 1 of 2

Sample ID

: SPORT0528-1

Lab ID

: 9803607-01

Matrix

: Soil

Date Collected

Date Received

: 03/23/98 : 03/25/98

Priority

: Routine

Collector

: Client

Parameter	Quailfier	Result	DL	RL	Units	DF	Anol	est Date	Time	Batch	М
Volatile Organics  BTEX - 4 items											
Benzene	Ŭ	0.00	1.00	2,00	ug/kg	1.0	TCL	03/28/98	0243	11909	7 1
Ethylbenzone	Ū	0.00	1.00	2.00	ug/kg	1.0					
Toluene	ប	0.00	1.00		ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	บ	0.00	1.00	2.00	ug/kg	1.0					

Surrogate Recovery	Test	Percent %	Acceptable Limits	
Bromofiuorobenzene	BTEX-8260	86.4	(53.5 - 154.)	
Dibromofluoromethano	BTEX-8260	88.0	(63.4 · 136.)	
Toluene-d8	BTEX-8260	86.0	(72.1 - 137.)	
Bromofluorobenzene	NAP-8260	86.4	(53.5 - 154.)	
Dibromoflucromethanc	NAP-8260	88.0	(63.4 - 136.)	
Tohume-d8	NAP-8260	86.0	(72.1 - 137.)	

M = Method	Method-Description

M1

**EPA 8260** 



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Laboratory Certificatio

STATE CEL सम EL NO EX7156/87294 E37472/87458 233 10512

10120

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Pertamouth Detachment-Env.

1899 North Hobson Avc.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 02, 1998

Page 2 of 2

025.

Sample ID

: SPORT0628-1

M = Method

Method-Description

#### Notes:

The qualifiers in this report are defined as follows:

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I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

indicates that a quality control analyse recovery is outside of specified acceptance criteria.

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any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

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(803) 556-8171 • Fax (803) 766-1178

\*9803607-01\*





Meeting roday's needs with a vision for remorrow.

Laboratory Certifications

GEL STATE FL NC SC TN E87156/87294 232 10120

1:87472/R745R 10592

02934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 03, 1998

Page 1 of 2

Sample ID Lab ID

: SPORT0628-2

Matrix

: 9803607-02

Date Collected

: Soil

: 03/23/98

Date Received

: 03/25/98 : Routine

**Priority** Collector

: Client

Parameter	Qualifier	Resuit	DL	RL	Units	DF	Anai	rst Date	Time	Batch	M
Volatile Organics										_	-
BTEX - 4 items											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	TCL	03/28/98	0314	119097	1
Ethylbenzene	U	0.565	1.00	2.00	ug/kg	1.0					
Toluene	u	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	1	2.49	1.00	4.00	ng/kg	1.0					
Naphthalene	U	0.765	1.00	2.00	ug/kg	1.0					
Extractable Organics					• •						
Polynucleur Aromatic H	lydrocarbons -	- 16 items									
Acenaphthene	ับ	0.00	167	333	ug/kg	1.0	TSD	03/30/98	1745	118976	2
Acenaphthylene	U	0.00	167	333	ug/kg	1.0					
Anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	ប	0.00	167	333	ug/kg	1.0					
Benzo(b)fluorauthene	Ų	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	U	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	ľ	0.00	167	333	ug/kg	1.0					
Chrysene	U	0.00	167	333	ug/kg	1.0					
Dibenzo(a.h)anthracene	U	0.00	167	333	ug/kg	1.0					
Fluoranthene	ប	0.00	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	i.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	1 <b>67</b>	333	ng/kg	1.0					
Naphthalene	Ū	0.00	167	333	ug/kg	1.0					
Phenanthrone	ប	0.00	167	333	ug/kg	1.0					
Pyrene	U	0.00	167	333	ug/kg	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

RDH 03/26/98 1315 118976 3

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\*9803607-02\*

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LEF: 802-825-2815



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Luimentory Certifications

 STATE
 GEL
 EPI

 FL
 E87150/87294
 687472/87498

 NC
 233
 5C
 10120
 10582

 TN
 02934
 02934

Client

Supervisor of Ship Building & Conversion SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Projecti Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 03, 1998

Page 2 of 2

Sample	: ID	1	
• 1			

SPO		

Surrogate Recovery	Test	Percent %	Acceptable Limits	
2-Fluorobiphenyl	M610	84.3	(30.0 - 115.)	
Nitrobenzene-d5	M610	67.7	(23.0 - 120.)	
p-Terphenyl-d14	M610	86.5	(37.3 - 128.)	
Bromofluorobenzene	BTEX-8260	84.8	(53.5 - 154.)	
Dibromofluoromethane	BTEX-8260	86.4	(63.4 - 136.)	
Tolucne-d8	BTEX-8260	84.0	(72.1 - 137.)	
Bromotlucrobenzene	NAP-8260	84.8	(53.5 - 154.)	
Dibromofluoromethanc	NAP-8260	86.4	(63.4 - 136.)	
Toluene-d8	NAP-8260	84.0	(72.1 - 137.)	

	1 :	
M = Method		Method-Description
MI		EPA 8260
M 2		EPA 8270
M 3		EPA 3550
	,	

#### Notes:

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J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a conceptration greater than the detection limit.

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in accordance with General Engineering Laboratories

standard operating procedures. Please direct

any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

Reviewed By

P O Box 30712 - Charleston, SC 29417 - 2040 Savage Roud - 29414

(803) 556-8171 · Fax (803) 766-1178

\*9803607-02\*



<sup>\*</sup> indicates that a quality control analyte recovery is outside of specified acceptance criteria.



Meeting today's needs with a vision for tomorrow.

**Laboratory Certifications** 

STATE GEL UP( E87472/87458 FL NC SC TN E87156/87294 233 10120 10582 02934

02934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Ponsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 03, 1998

Page 1 of 2

Sample ID

: SPORT0628-3

Lab ID

: 9803607-03

Matrix

: Soil

Date Collected

: 03/23/98

Date Received

: 03/25/98

Priority

: Routine

Collector

: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analysi	Date	Time	Batch	M
Volatile Organics			•								
BTEX - 4 items											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	TCL 0	3/28/98	0345	11909	7 1
Ethylbenzenc	Ľ	0.00	1.00	2.00	ug/kg	1.0		J. 20/30	0049		
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthaiene	Ü	0.00	1.00	2.00	ue/kg	1.0					
Extractable Organics		5.00	.,,,	2.00	-3-5	1.0					
Polynucleur Aromatic I	Hydrocarbons -	16 items									
Accnaphthene	Ü	0.00	167	333	ug/kg	1.0	TSD 0	3/30/98	1815	11897	5 7
Acenaphthylene	C	0.00	167	333	ug/kg	1.0		J1 J 01 J 0	1015	11057	, 2
Anthracene	Ü	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	ΰ	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	Ū	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	บ	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perytene	Ū	0.00	167	333	ug/kg	1.0					
Benzo(k)fluoranthene	Ū	0.00	167	333	ug/kg	1.0					
Chrysenc	U	0.00	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	U	0.00	167	333	u <b>g</b> ∕k <b>g</b>	1.0					
Fluoranthene	Ŭ	0.00	167	333	n8∖kā añ√r	1.0	4				
Fluorenc	Ü	0.00	167	333	ug/kg	1.0					
indeno(1,2,3-c,d)pyrene		0.00	167	333	ug/kg	1.0					
Naphthalene	Ū	0.00	167	333	ug/kg	1.0					
Phonanthrene	Ū	0.00	167	333	ug/kg	1.0					
Pyrene	Ü	0.00	167	333	ug/kg	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

RDH 03/26/98 1315 118976 3

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\*9803607-03\*





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Laboratory Certifications

STATE GEL BP1
FL E87156/87294 FR7472/87458
NC 233
SC 10120 10582
TN 02934 02934

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 03, 1998

Page 2 of 2

	Sample ID	: SPORT0628	3-3	
Surrogate Recovery	Test	Percent%	Acceptable Limits	
2-Fluorobiphenyl	M610	70.3	(30.0 - 115.)	
Nitrobenzene-d5	M610	70.8	(23.0 - 120.)	
p-Terphenyl-d14	M610	82.3	(37.3 - 128.)	
Bromotluorobenzene	BTEX-8260	87.4	(53,5 - 154.)	
Dibromorluoromethane	BTEX-8260	84.4	(63.4 - 136.)	
Toluenz-d8	BTEX-8260	84.2	(72.1 - 137.)	
Bromofluorobenzene	NAP-8260	87.4	(53.5 - 154.)	
Dibromofluoromethane	NAP-8250	84.4	(63.4 - 136.)	
Toluene-d8	NAP-8260	84.2	(72.1 - 137.)	

M = Method	Method-Des	cription	 	
M 1	EDA 906D			
	EPA 8260			
M 2	EPA 8270			
М 3	EPA 3550			

#### Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

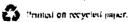
This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakency at (803) 769-7386.

Paviawad Pu

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\*9803607-03\*



<sup>\*</sup> indicates that a quality control analyte recovery is outside of specified acceptance criteria.



. સદ*્યાન*ું,

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Luboratory Certifications

STATE GEL ПРІ Е97472/87458 H S S N E\$7156/87294 233 10582 02934 10120 02934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 03, 1998

Page 1 of 2

Sample ID

: SPORT0628-4

Lab ID

: 9803607-04

Matrix

: Soil

Date Collected

: 03/23/98

Date Received

: 03/25/98

Priority

: Routine

Collector

: Client

Parameter	Qualifier	Resuit	DL	RL	Units	DF	Analys	t Date	Time	Batch	M
Volatile Organics										<del></del>	
BTEX - 4 items											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	TCL (	03/30/98	1739	119097	1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	ť	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	Ū	0.00	1.00	2.00	ug/kg	1.0					
Extractable Organics											
Polynuclear Aromatic H	lydrocarbons -	· 16 items									
Acenaphthene	· u	0.00	167	333	ug/kg	1.0	TSD	03/30/98	1845	118976	i 2
Accnaphthylene	ŭ	0.00	167	333	ug/kg	1.0					
Anthracenc	U	0.00	167	333	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	167	333	ug/kg	1.0					
Benzo(a)pyrene	U	0.00	167	333	ug/kg	1.0					
Benzo(b)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Benzo(ghi)perylene	Ų	0.00	167	333	ug/kg	1.0					
Bcnzo(k)fluoranthene	U	0.00	167	333	ug/kg	1.0					
Chrysene	ប	0.00	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	ับ	0.00	167	333	ug/kg	1.0					
Fluoranthene	Ū	0.00	167	333	ug/kg	1.0					
Fluorene	U	0.00	167	333	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	Ū	0.00	167	333	ug/kg	1.0					
Naphthalene	U	0.00	167	333	ug/kg	1.0					
Phenanthrene	U	0.00	167	333	ug/kg	1.0					
Pyrene	บ	0.00	167	333	ug/kg	1.0					
•	=				<del>-</del>						

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

RDH 03/26/98 1315 118976 3

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Laboratory Certifications

STATE GEL FL NC E87156/87294 E87472/87458 233 10592 SC 10120 02934 02934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 03, 1998

Page 2 of 2

	Sample ID	: SPORT0628	3-4	
Surrogate Recovery	Test	Percent %	Acceptable Limits	
2-Fluorobiphenyl	M610	61.3	(30.0 - 115.)	
Nitrobenzene-d5	M610	<i>5</i> 7.5	(23.0 - 120.)	
p-Terphenyl-d14	M610	64.7	(37.3 - 128.)	
Bromofluoropenzene	BTEX-8260	84.2	(53.5 - 154.)	
Dibromofluoromethane	BTEX-8260	87.2	(63.4 - 136.)	
Toluene-d8	BTEX-8260	83.0	<b>(72.1 - 137.)</b>	
Bromofluorobenzene	NAP-8260	84.2	(53.5 - 154.)	
Dibromofluoromethane	NAP-8260	87.2	(63.4 - 136.)	
Toluene-d8	NAP-8260	83.0	(72.1 - 137.)	

	 		<del></del>	
M = Method	Method-Descr	ription		
M 1	EPA 8260			
M 2	EPA 8270			
М 3	EPA 3550			

### Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

\* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories

standard operating procedures. Please direct

any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

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. Laboratory Certifications

STATE GEL E97156/57294 E87472/87458 NC SC TN 233 10120 10582 02934 02934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

œ: NPWC00197

Report Date: April 03, 1998

Page 1 of 2

Sample ID

: SPORT0628-5

Lab ID

: 9803607-05

Matrix Date Collected

: Soil

Date Received

: 03/23/98

Priority

: 03/25/98

: Routine

Collector

: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Anai	yst Date	Time	Batch	М
Volatile Organics					<u> </u>						
BTEX - 4 items											
Benzene	U	0.00	1.00	2.00	upkg	1.0	TCL	03/28/98	0446	110000	
Ethylbenzene	บ	0.00	1.00	2.00	ug/kg	1.0	102	03/26/96	U <del>448</del>	119097	1
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	บ	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	U	0.00	1.00	2.00	ng/kg	1.0					
Extractable Organics	•	4.44	1.00	2.00	GRAF	1.0					
Polynuclear Arematic H	lydrocarbons -	16 items									
Acenaphthene	U	0.00	167	333	naika	1.0	TSD	03/30/08	1514		
Acenaphthylene	Ū	0.00	167	333	ug/kg	1.0	130	03/30/98	1914	118976	2
Anthracene	Ū	0.00	167	333	ug/kg						
Benzo(a)anthracenc	Ū	0.00	167		ug/kg	1.0					
Benzo(a)pyrene	Ū	0.00	167	333 333	ug/kg	1.0					
Benzo(b)fluoranthene	Ü	0.00	167		ug/kg	1.0					
Benzo(ghi)perylene	ū	0.00	167	333 333	ug/kg	1.0					
Benzo(k)fluoranthene	Ŭ	0.00	167		ug⁄kg =d-=	1.0					
Chrysene	ū	0.00	167	333	ug/kg	1.0					
Dibenzo(a,h)anthracene	Ū	0.00	167		ug/kg	1.0					
Fluoranthene	ŭ	0.00	167		n≅∖kg	1.0					
Fluorene	Ū	0.00	167		ug/kg	1.0					
Indono(1,2,3-c,d)pyrene		0.00			ug/kg	1.0					
Naphthalene	Ü	0.00	167		ug/kg	1.0					
Phenanthrene	Ü	0.00	167		ug/kg	1.0					
Pyrene	ŭ	0.00	167		nō∖ĸū	1.0					
• • • • • • • • • • • • • • • • • • • •	U	0.00	167	333	ug/kg	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

RDH 03/26/98 1315 118976 3

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Laboratory Cert Rentions

EPI E87472/87458 GEL E S S Z E87156/87294 10120 10582

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 03, 1998

Page 2 of 2

02934

	Sample ID	: SPORT0628	-5	
Surrogate Recovery	Test	Percent%	Acceptable Limits	
2-Fluorobiphenyl	M610	63.2	(30.0 - 115.)	
Nitrobenzene-d5	M610	64.7	(23.0 - 120.)	
p-Temhenyl-d14	M610	68.7	(37.3 - 128.)	
Bromofluorobenzene	BTEX-8260	86.4	(53.5 - 154.)	
Dibromofluoromethane	BTEX-8260	88.2	(63,4 - 136.)	
Toluene-da	BTEX-8260	85.0	( <b>72.1 -</b> 137.)	
Bromofluorobenzene	NAP-8260	86 4	(53.5 - 154.)	
Dibromofluoromethane	NAP-8260	88.2	(63.4 - 136.)	
Toluene-d8	NAP-8260	85.0	( <b>72.1</b> - 137.)	

M = Method	Method-Description	 · · · · · · · · · · · · · · · · · · ·
M )	EPA 8260	
M 2 M 3	EPA 8270 EPA 3550	

#### Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories

standard operating procedures. Please direct

any questions to your Project Manager, Karen Blakency at (803) 769-7386.

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\*9803607-05\*



indicates that a quality control analyte recovery is outside of specified acceptance criteria.



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Lulmentory Certifications

STATE GEL E87472/87458 E87156/87294 23.1 10120

02734

10582 02934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 03, 1998

Page | of 2

Sample ID

: SPORT0628-6

Lab ID

: 9803607-06

Matrix

: Soil

Date Collected

: 03/23/98

Date Received

: 03/25/98

Priority

: Routine

Collector

: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Anai	yst Date	Time	Batch	M
Extractable Organics						·					
Polynuclear Aromatic H	tydrocarbans -	16 items									
Acenaphthene	U	0.00	662	1320	ug/ <b>kg</b>	4.0	TSD	03/30/98	1944	118976	6 l
Accnaphthylene	<b>u</b> (	0.00	662	1320	ug/kg	4.0					
Anthracene	Ū	0.00	662	1320	ug/kg	4.0					
Benzo(a)anthracene	ប	0.00	662	1320	ug/kg	4.0					
Benzo(a)pyrene	U	0.00	662	1320	ug/kg	4.0					
Benzo(b)fluoranthene	บ	0.00	662	1320	ug/kg	4.0					
Benzo(ghi)perylene	U	0.00	662	1320	ug/kg	4.0					
Benzo(k)fluoranthene	บ	0.00	662	1320	ug/kg	4.0					
Chrysene	U	0.00	662	1320	ug/kg	4.0					
Dibenzo(a,h)anthracene	U!	0.00	662	1320	ug/kg	4.0					
Fluoranthene	U	0.00	662	1320	ug/kg	4.0					
Fluorene	U	0.00	662	1320	ug/kg	4.0					
Indeno(1,2,3-c,d)pyrene	บ	0.00	662	1320	ug/kg	4.0					
Naphthalene	ប	0.00	662	1320	ug/kg	4.0					
Phenanthrene	U	0.00	562	1320	ug/kg	4.0					
Pyrene	U	0.00	662	1320	ug/kg	4.0					

### The following prep procedures were performed:

GC/MS Base/Neutral Compounds

RDH 03/26/98 1315 118976 2

#### Comments:

A dilution was required for Extractable Organics due to matrix interference. As a result, the detection limits are elevated,

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K Tater Curt 1 STATE ĞEL E87156/8729% NC SC TN 02934

Client:

Supervisor of Ship Building & Conversion

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1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 03, 1998

Page 2 of 2

	Sample ID	: \$PORT0628	B-6	
Surrogate Recovery	Test	Percent%	Acceptable Limits	· .
2-Fluorobiphenyl	M610	82.9	(30.0 - 115.)	
Nitrobenzene-d5	M610	60.3	(23.0 - 120.)	
p-Terphenyl-d14	M610	86.2	(37.3 - 128.)	
M = Method		Method-Descrip	ption	

M = Method	Method-Descript
M 1	EPA 8270
M 2	EPA 3550

#### Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

This data report has been prepared and reviewed in asserdance with General Engineering Laboratories

standard operating procedures. Please direct

any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

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indicates that a quality control analyte recovery is outside of specified acceptance criteria.



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STATE CEL EN7156/97294 E87472/8745A NC SC 10582 02934 10120 07934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 03, 1998

Page 1 of 2

Sample ID

: SPORT0628-7

Lab ID

: 9**803607**-07

Matrix

: Soil

Date Collected

: 03/23/98

Date Received

: 03/25/98

Priority

: Routine

Collector

: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analy	st Date	Time	Batch	M
Extractable Organics		-	·						<u> </u>		_
Polynuclear Aromatic E	Lydrocarbons •	16 items			-						
Accazenthene	u	0.00	664	1330	ug/kg	4.0	TSD	03/30/98	2014	11897	5 1
Acenaphthylene	Ū	0.00	664	1330	ug/kg	4.0					
Anthracene	Ū	0.00	664	1330	ng/kg	4.0					
Benzo(a)anthracene	U	0.00	664	1330	υg/kg	4.0					
Benzo(a)pyrene	U	0.00	664	1330	ug/kg	4.0					
Benzo(b)fluoranthene	U	0.00	664	1330	ug/kg	4.0					
Benzo(ghi)perylene	U	0.00	664	1330	ug/kg	4.0					
Велио(k)Пиотальнене	U	0.00	664	1330	ug/kg	4.0					
Chrysene	U	0.00	664	1330	ug/kg	4.0					
Dibenzo(a.h)anthracene	U	0.00	664	1330	ug/kg	4.0					
Fluoranthene	U	0.00	6 <b>64</b>	1330	ug/kg	4.0					
Fluorene	ប	0.00	6 <b>64</b>	1330	ug/kg	4.0					
Indeno(1,2,3-c.d)pyrene	ម	0.00	654	1330	ng/kg	4.0					
Naphthalene	U	0.00	664	1330	ug/kg	4.0					
Phenanthrene	U	0.00	5 <b>6</b> 4	1330	ug/kg	4.0					
Pyrene	บ	0.00	664	1330	ug/kg	4.0					

### The following prep procedures were performed:

GC/MS Base/Neutral Compounds

RDH 03/26/98 1315 118976 2

#### Comments:

A dilution was required for Extractable Organics due to matrix interference. As a result, the detection limits are elevated.

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STATE GEL. FI. E87156/87294 E87472/87458 NC 233 SC 10120 10582 02934 02934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Pensmouth Detachment

cc: NPWC00197

Report Date: April 03, 1998

Page 2 of 2

San	mie	ID

: SPORT0528-7

Surrogate Recovery	Test	Percent %	Acceptable Limits	
2-Fluorobiphenyl	M610	83.9	(30.0 - 115.)	
Nitrobenzene-d5	M610	59.4	(23.0 - 120.)	
p-Terphenyi-d14	M610	94.4	(37.3 - 128.)	

M = Method	Method-Description
Ml	EPA 8270
M 2	EPA 3550

#### Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager. Karen Blakeney at (803) 769-7386.

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\*9803607-07\*



<sup>\*</sup> indicates that a quality control analyte recovery is outside of specified acceptance criteria.



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Luberatory Certifications

 STATE
 GEL
 EPI

 FL
 E87156/87294
 EX7472/87458

 NC
 233
 SC
 10120
 10582

 TN
 02994
 02934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 03, 1998

Page I of 2

 Sample ID
 : SPORT0628-8

 Lab ID
 : 9803607-08

 Matrix
 : Soil

 Date Collected
 : 03/23/98

 Date Received
 : 03/25/98

 Priority
 : Routine

 Collector
 : Client

Parameter	Qualitier	Result	Df.	RL	Units	DF	Anal	yst Date	Time	Batch	M
Extractable Organics											
Polynuclear Aromatic F	lydrocarbons -	16 items									
Accnaphthene	Ū	0.00	666	1330	ug/kg	4.0	TSD	03/30/98	2044	11897	6 1
Acenaphthylene	U	0.00	666	1330	ug/kg	4.0		05.56.70	20-	11027	•
Anthracene	U	0.00	666	1330	ug/kg	4.0					
Benzo(a)anthracene	Ū	0.00	66 <b>6</b>	1330	це/kg	4.0					
Benzo(a)pyrene	Ü	0.00	666	1330	ug/kg	4.0					
Benzo(b)fluoranthene	Ü	0.00	666	1330	ug/kg	40					
Benzo(ghi)perylene	U	0.00	666	1330	ug/kg	4.0					
Benzo(k)fluoranthene	Ü	0.00	666	1330	ug/kg	4.0					
Chrysene	U	0.00	666	1330	ug/kg	4.0					
Dibenzo(a.h)anthracene	U	0.00	6 <b>66</b>	1330	ug/kg	4.0					
Fluoranthenc	L	0.00	666	1330	ug/kg	4.0					
Fluorene	U	0.00	666	1330	ug/kg	4.0					
Indeno(1,2,3-c,d)pyrene	ť	0.00	666	1330	ug/kg	4.0					
Naphthalene	U	0.00	6 <b>66</b>	1330	ug/kg	4.0					
Phenanthrene	U	0.00	666	1330	ug/kg	4.0					
Pyrene	U	0.00	666	1330	ng/kg	4.0					

### The following prep procedures were performed:

GC/MS Base/Neutral Compounds

RDH 03/26/98 1315 118976 2

### Comments:

A dilution was required for Extractable Organics due to matrix interference. As a result, the detection limits are elevated.

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**"9803607-08"** 



## GINEERING LABORATORIES

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Laboratory Cartifaction STATE CEL E87156/87294 1058

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 03, 1998

Page 2 of 2

	Sample ID	: SPORT0628-	8	
Surrogate Recovery	Test	Percent %	Acceptable Limits	
2-Fluorobiphenyl	M610	88.5	(30.0 - 115.)	
Nitrobenzene-d5	M610	68.2	(23.0 - 120.)	
p-Terphenyl-d14	M610	97.0	(37.3 - 128.)	

M = Method	Method-Description	
	<del></del>	 
M 1	EPA 8270	
M 2	EPA 3550	

#### Notes:

The quaitiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager. Karen Blakeney at (803) 769-7386.

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indicates that a quality control analyte recovery is outside of specified acceptance criteria.



### GENERAL ENGINEER

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CEL E87156/87294 E87472/87458 233 10582 02934 10120 02934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

ce: NPWC00197

Report Date: April 03, 1998

Page 1 of 2

Sample ID Lab ID

: SPORT0628-9 : 9803607-09

Matrix Date Collected Date Received

: Soil : 03/23/98 : 03/25/98

Priority Collector

: Routine : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Anal	yst Date	Time	Batch	. м
Extractable Organics		· · · · · · · · · · · · · · · · · · ·	·								
Polynuciear Aromatic H	lydrocarbons -	16 items									
Acenaphthene	Ū	0.00	166	332	ug/kg	1.0	TSD	04/03/98	1102	11897	<b>რ</b> 1
Acenaphthylenc	U	0.00	166	332	ug/kg	1.0				, . 4, , .	
Anthracene	U	0.00	166	332	nā∖ <b>Kā</b>	1.0					
Benzo(a)anthracene	U	0.00	166	332	ug/kg	1.0					
Bcnzo(a)pyrene	U	0.00	166	332	ug/kg	1.0					
Benzo(b)fluoranthene	ប	0.00	166	332	ug/kg	1.0					
Bonzo(ghi)perylene	U	0.00	1 <b>66</b>	332	ug/kg	1.0					
Benzo(k)fluoranthene	U	0.00	166	332	ug/kg	1.0					
Chrysene	บ	0.00	166	332	ug/kg	1.0					
Dibenzo(a,h)anthracene	Ü	0.00	166	332	ug/kg	1.0					
Fluoranthene	U	0.00	166	332	ug/kg	1.0					
Fluorene	U	0.00	166	332	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	U	0.00	166	332	ug/kg	1.0					
Naphthalene	U	0.00	166	332	ug/kg	1.0					
Phenanthrene	U	0.00	166	332	ug/kg	1.0					
Рутепе	ប	0.00	166	332	ug/kg	1.0					

### The following prep procedures were performed:

GC/MS Base/Neutral Compounds

RDH 03/26/98 1315 118976 2

Surrogate Recovery	Test	Percent%	Acceptable Limits	
2-Fluorobiphenyl Nitrohenzene-d5 p-Terphenyl-d14	M610 M610 M610	76.3 55.1 77.8	(30.0 - 115.) (23.0 - 120.) (37.3 - 128.)	

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### THE LENGINEERING LABORATORIES

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Laboratory Certifie d :

STATE GEL EB71\_6/87294

10120 105/2 029.1

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 03, 1998

Page 2 of 2

Sample ID

: SPORT0628-9

Surrogate Recovery

Test

Percent%

Acceptable Limits

M = Method	Meti	nod-Description	
MI	EP.	A 8270	
M 2	EP	A 3550	

#### Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit,

tes presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL). tes that the analyte was not detected at a concentration greater than the detection limit.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

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<sup>&</sup>quot; includes that a quality control analyte recovery is outside of specified acceptance criteria.



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Luburatory Certifications

STATE GEL FL E8719 NC 233 SC 10126 TN 02934 EPI E87472/8745H E87156/87294 233 10120 10582 02934 02934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Avc.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 14, 1998

Page 1 of 2

Sample ID Lab ID

: SPORT0649-1

Matrix

: 9804197-01

Date Collected

: Soil

: 04/08/98

Date Received

: 04/08/98

Priority Collector : Routine

Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analys	t Date	Time	Butch	M
Volatile Organics											
BTEX - 4 items											
Benzene	U	0.00	1.00	2.00	ug/kg	1.0	TCL	04/09/98	2037	119824	1 1
Ethylbenzene	U	0.00	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	J	1.16	1.00	4.00	ug/kg	1.0					
Naphthalene		5.74	1.00	2.00	ug/kg	1.0					

Surrogate Recovery	Test	Percent %	Acceptable Limits	
Bromofluorobenzene	BTEX-8260	87. <b>8</b>	(53.5 - 154.)	
Dibromofluoromethane	BTEX-8260	85.8	(63.4 - 136.)	
Toluene-d8	BTEX-8260	87.2	(72.1 - 137.)	
Bromofluorobenzene	NAP-8260	87.8	(53.5 - 154.)	
Dibromofluoromethane	NAP-8250	85.8	(63.4 - 136.)	
Tolucne-d8	NAP-8260	37.2	(72.1 - 137.)	

M = Method	<u> </u>		Method	-Description

M 1

EPA 8250

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\*9804197-01\*

Contact: Project: Description:	CENERAL ENGINEERING LABORATORIES  Laberatory Certifications STATE GEL FL E87155/87294 NG 233 SG 10120 IN /2914  Supervisor of Ship Building & Conversion SUPERIOR Portsmouth Detachment Env. 1899 North Hobson Ave. North Charleston, South Caroline 29405-2105 Mr. Brilliers SUPSKIP-Portsmouth Detachment
	Report Date: April 14. 1998
<del>                                      </del>	SPORTU649-1
M = Method	Method-Description

The qualifiers in this report are delined as follows

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not desected at a concentration greater than the detection limit.

\* indicates that a quality control analyte recovery is outside or specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager. Karen Blakeney at (803) 769-7386

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Laboratory Cartifications

EPI E37472/8745R STATE CEL FL 1597156/87294 NC 233 5C TN 10120 10582 02934 U2934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2105

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 14, 1998

Page 1 of 2

Sample ID Lab ID

: SPORT0649-2

: 9804197-02

Matrix

Date Collected

: Soil

: 04/08/98

Date Received

: ()4/()8/98

Priority

: Routine

Collector

: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analy	rst Date	Time	Batch	М
Volatile Organics					,						
BTEX - 4 items			}								
Benzene	U	0.00	1.00	2.00	บ <b>g∕kg</b>	1.0	TCL	04/09/98	2108	11982	4 1
Ethylbenzens	Ü	0.519	1.00	2.00	ug/kg	1.0					
Toluene	U	0.00	1.00	2.00	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	00.1	4.00	ug/kg	1.0					
Naphthalene	Ü	0.00	1.00	2.00	ug/kg	1.0					
Extructable Organics											
Polynuclear Aromatic H	Tydrocarbons -	16 items									
Acenaphthene	ับ	0.00	164	330	ug/kg	1.0	RLC	04/10/98	1512	119814	4 2
Acenaphthylene	Ū	0.00	164	330	ug/kg	1.0				• ***	
Anthracene	ŭ	0.00	164	330	ug/kg	1.0					
Benzo(a)anthracene	U	0.00	164	330	ug/kg	1.0					
Benzo(g)pyrene	U	0.00	164	330	ug/kg	1.0					
Benzo(b)fluoranthene	τ	0.00	164	330	ug/kg	1.0					
Benzo(gni)perylene	บ	0.00	164	330	ug/kg	1.0					
Benzo(k)fluoranmenc	U	0.00	164	330	ug/kg	1.0					
Chrysene	U	0.00	164	330	ug/kg	1.0					
Dibenzo(a.h)anthracene	U	0.00	164	330	ug/kg	1.0					
Fluoranthene	ប	0.00	164	330	ug/kg	1.0					
Fluorene	U	0.00	164	330	ug/kg	1.0					
Indeno(1,2,3-c,d)pyrene	Ü	0.00	164	3 <b>30</b>	ug/kg	1.0					
Naphthalene	Ū	0.00	164	330	ug/kg	1.0					
Phonanthrene	Ü	0.00	164	330	ug/kg	1.0					
Pyrene	Ŭ	0.00	164	330	ug/kg	1.0					

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

HDB 04/09/98 1600 119814 3

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\*9804197-02\*

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Laboratory Certifications

STATE GEI. FL NC E87156/87294 E87472/87458 233

SC TN 10120 02934

10582 02934

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Hobson Avc.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWC00197

Report Date: April 14, 1998

Page 2 of 2

	Test	: SPOR 10649-2		
Surrogate Recovery		Percent%	Acceptable Limits	 •
2-Fluorobiphenyl	M610	75.7	(30.0 - 115.)	
Nitrobenzene-d5	M610	40.1	(23.0 - 120.)	
p-Terphenyl-d14	M610	78.6	(37.3 - 128.)	
Bromofluorobenzenc	BTEX-8260	86.2	(53.5 - 154.)	
Dibromoflucromethane	BTEX-8260	86.6	(63.4 - 136.)	
Toluene-d8	BTEX-8260	87.0	<b>(72.1</b> - 137.)	
Bromofluorobenzenc	NAP-8260	86.2	(53.5 - 154.)	
Dibromofluoromethane	NAP-8260	86.6	(63.4 - 136.)	
Toluene-d8	NAP-8260	87.0	(72.1 - 137.)	

M = Method	Method-Description	
M 1	EPA 8260	
М 2	EPA 8270	
M 3	EPA 3550	

The qualifiers in this report are defined as follows:

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